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Cordery et al.

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[54] NETWORK OPEN METERING SYSTEM

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[*] Notice: This patent is subject to a terminal disclaimer.

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[22] Filed: **Dec. 19, 1995**

[51] **Int. Cl.**[7] **G07B 17/00**; H04L 9/00

[52] **U.S. Cl.** **705/60**; 380/51; 705/410; 705/62

[58] **Field of Search** 380/25, 49, 51; 395/113, 117; 705/41, 400, 401, 402, 60, 61, 62, 408, 410

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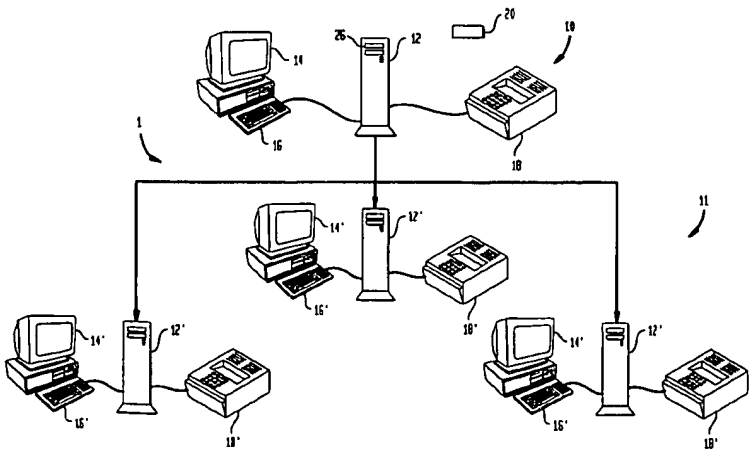
Primary Examiner—Pinchus M. Laufer

Attorney, Agent, or Firm—Charles R. Malandra, Jr.; Michael E. Melton

[57] **ABSTRACT**

A transaction evidencing system includes a plurality of computer systems operatively configured to form a network with one of the computer systems functioning as a server and the remaining computer systems functioning as clients. Each of the computer systems includes a processor, memory and storage media. At least some of the storage means includes non-metering application programs that are selectively run on the client computer systems. An unsecured printer is operatively coupled to at least one of the computer systems for printing in accordance with the non-metering application programs. A portable vault card, which is removably coupled to the server computer system, includes digital token generation and transaction accounting processing. The client computer systems issue requests for digital tokens to the server computer system in response to requests for indicia from the non-metering application programs. The requests for digital tokens include predetermined information required by the token generation processing. The server computer system communicates with the vault card when the vault card is coupled to the server computer system, sending the requests for digital tokens to the vault card and receiving from the vault card the generated digital tokens. The server computer system sends each digital token to the client computer system that requested the digital token. The requesting client computer system generates an indicia bitmap from the digital token. The server computer system receives from the vault a transaction record that includes the digital token and the predetermined information and stores the transaction record in its storage media.

15 Claims, 8 Drawing Sheets



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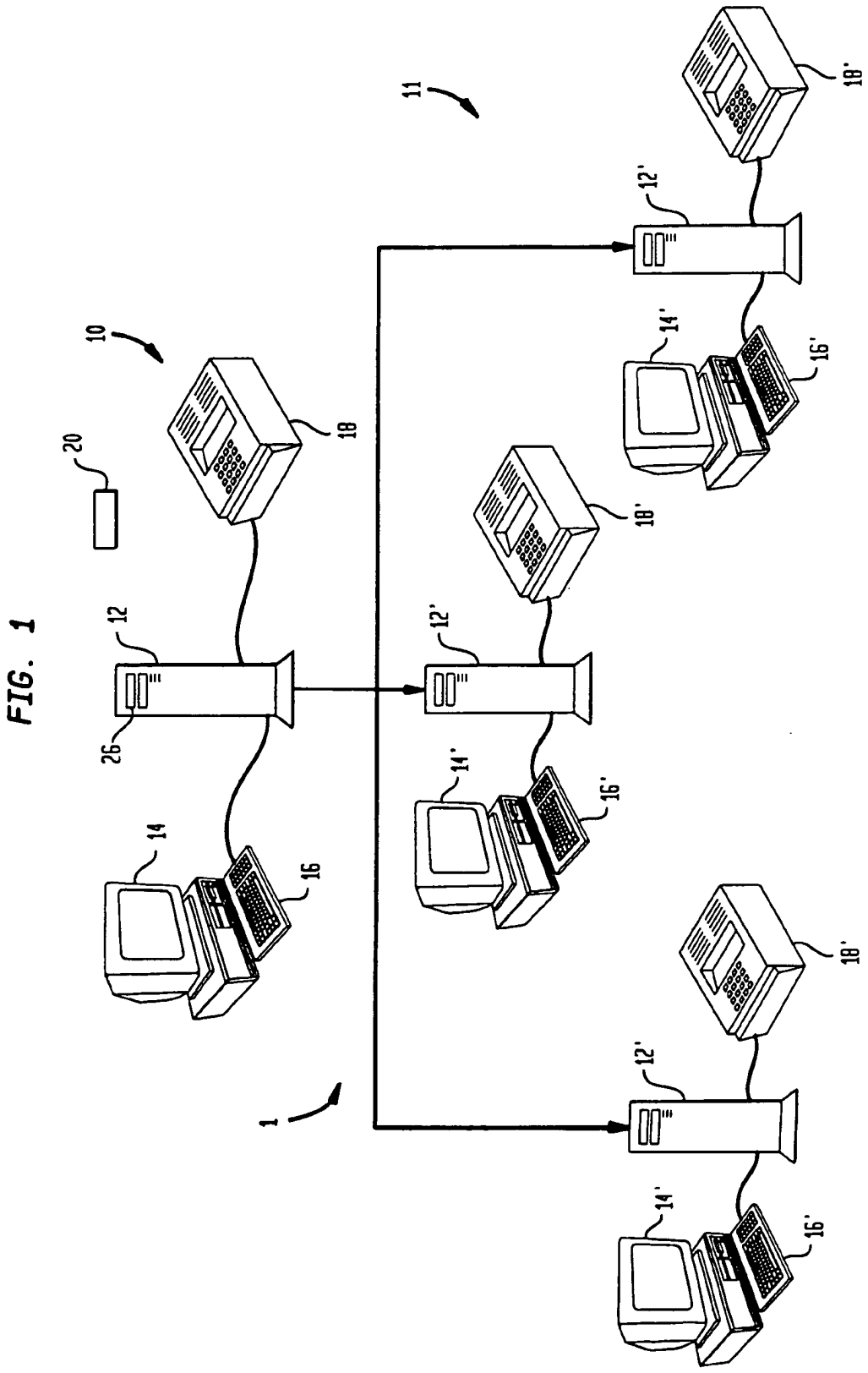


FIG. 1

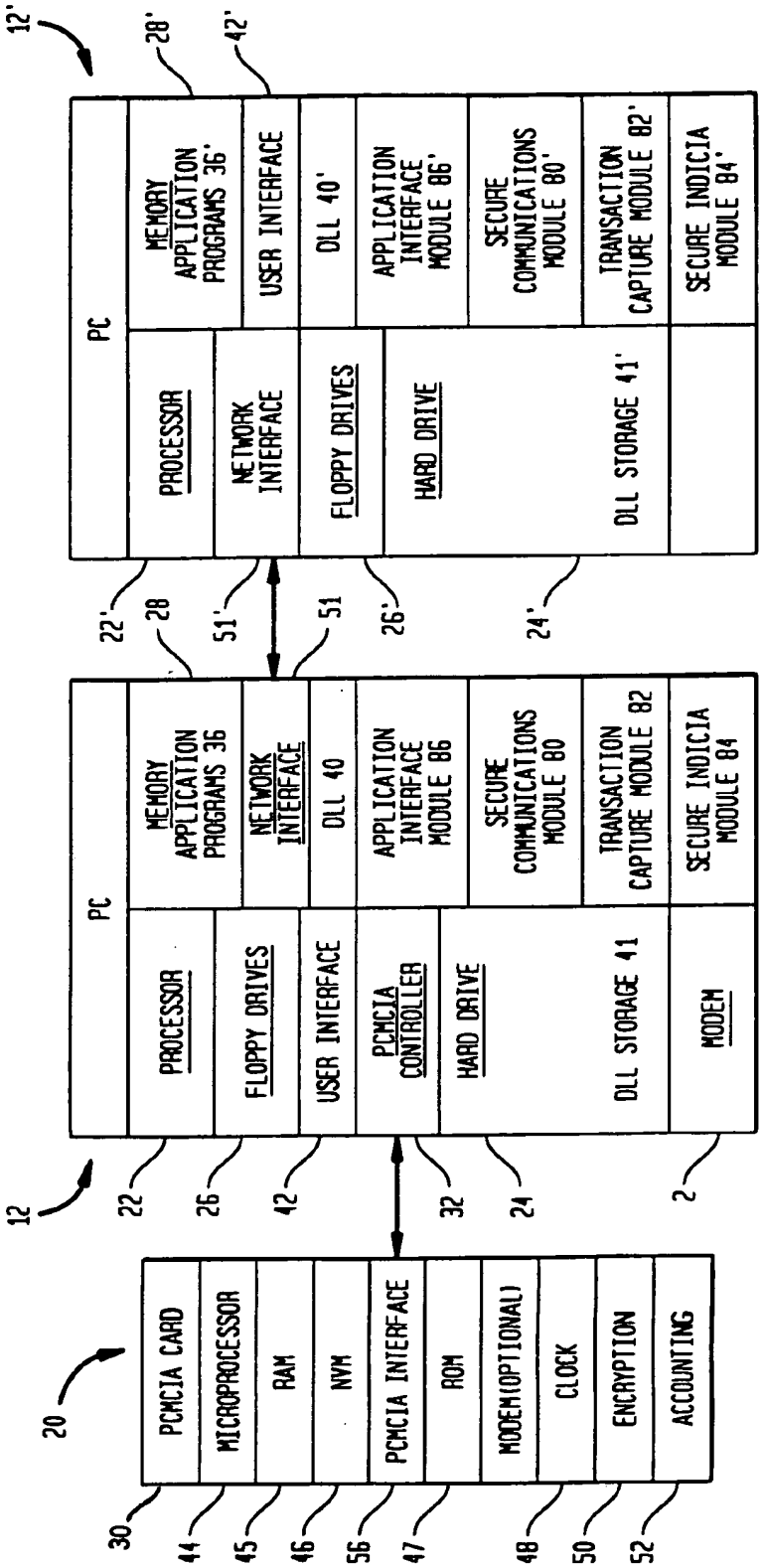

PC
MEMORY APPLICATION PROGRAMS 36'
USER INTERFACE
DLL 40'
APPLICATION INTERFACE MODULE 86'
SECURE COMMUNICATIONS MODULE 80'
TRANSACTION CAPTURE MODULE 82'
SECURE INDICIA MODULE 84'
PROCESSOR
NETWORK INTERFACE
FLOPPY DRIVES
HARD DRIVE
DLL STORAGE 41'
12'
28'
42'
22'
28
51'
51
26'
24'
PC
MEMORY APPLICATION PROGRAMS 36
NETWORK INTERFACE
DLL 40
APPLICATION INTERFACE MODULE 86
SECURE COMMUNICATIONS MODULE 80
TRANSACTION CAPTURE MODULE 82
SECURE INDICIA MODULE 84
PROCESSOR
FLOPPY DRIVES
USER INTERFACE
PCMCIA CONTROLLER
HARD DRIVE
DLL STORAGE 41
MODEM
12
22
26
42
32
24
2
20
PCMCIA CARD
MICROPROCESSOR
RAM
NVM
PCMCIA INTERFACE
ROM
MODEM(OPTIONAL)
CLOCK
ENCRYPTION
ACCOUNTING
30
44
45
46
56
47
48
50
52

FIG. 2

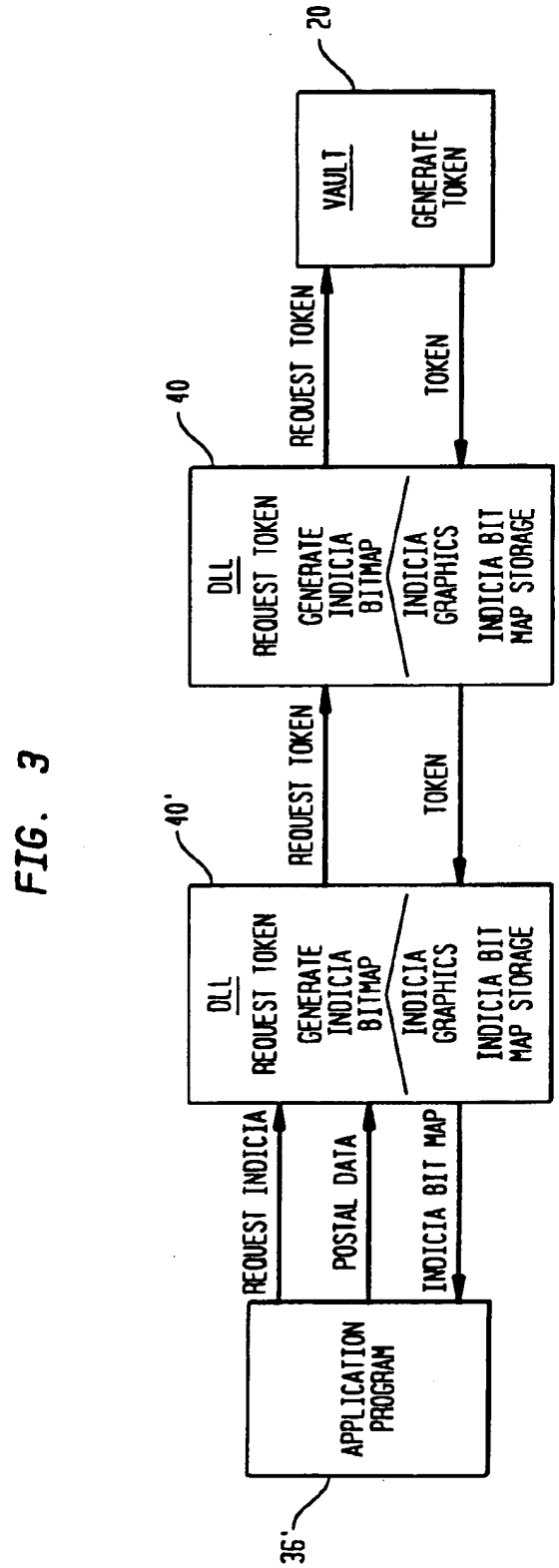

20
VAULT
GENERATE TOKEN
REQUEST TOKEN
TOKEN
40
DLL
REQUEST TOKEN
GENERATE INDICIA BITMAP
INDICIA GRAPHICS
INDICIA BIT MAP STORAGE
REQUEST TOKEN
TOKEN
40'
DLL
REQUEST TOKEN
GENERATE INDICIA BITMAP
INDICIA GRAPHICS
INDICIA BIT MAP STORAGE
REQUEST INDICIA
POSTAL DATA
INDICIA BIT MAP
APPLICATION PROGRAM
36'

FIG. 3

FIG. 4A

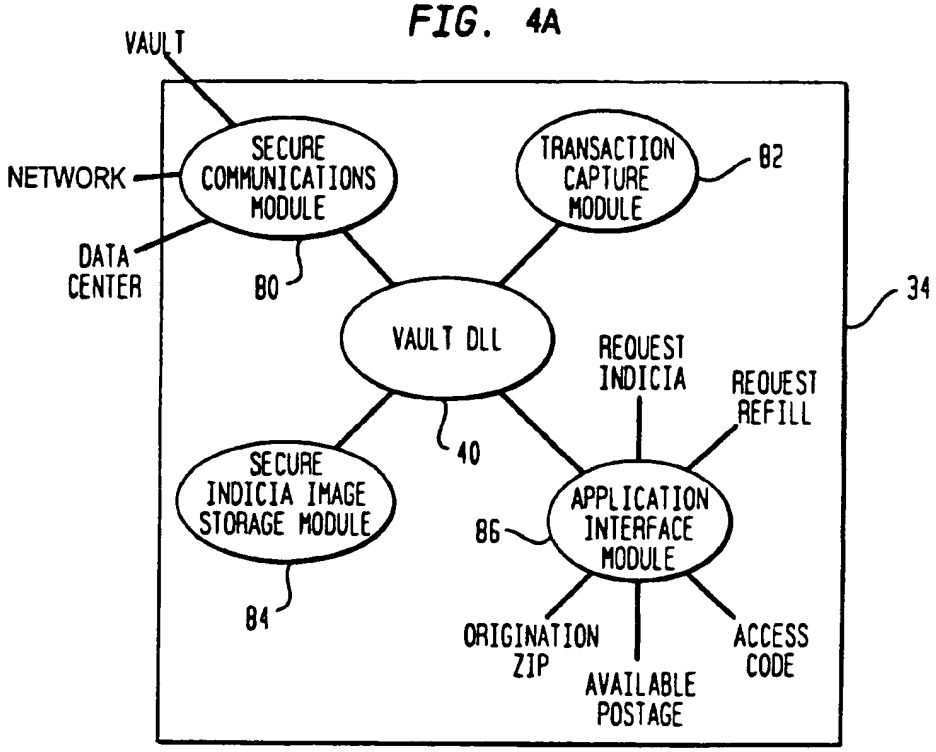

VAULT
NETWORK
SECURE COMMUNICATIONS MODULE
DATA CENTER
80
TRANSACTION CAPTURE MODULE
82
34
VAULT DLL
40
REQUEST INDICIA
REQUEST REFILL
SECURE INDICIA IMAGE STORAGE MODULE
84
APPLICATION INTERFACE MODULE
86
ORIGINATION ZIP
AVAILABLE POSTAGE
ACCESS CODE

FIG. 4B

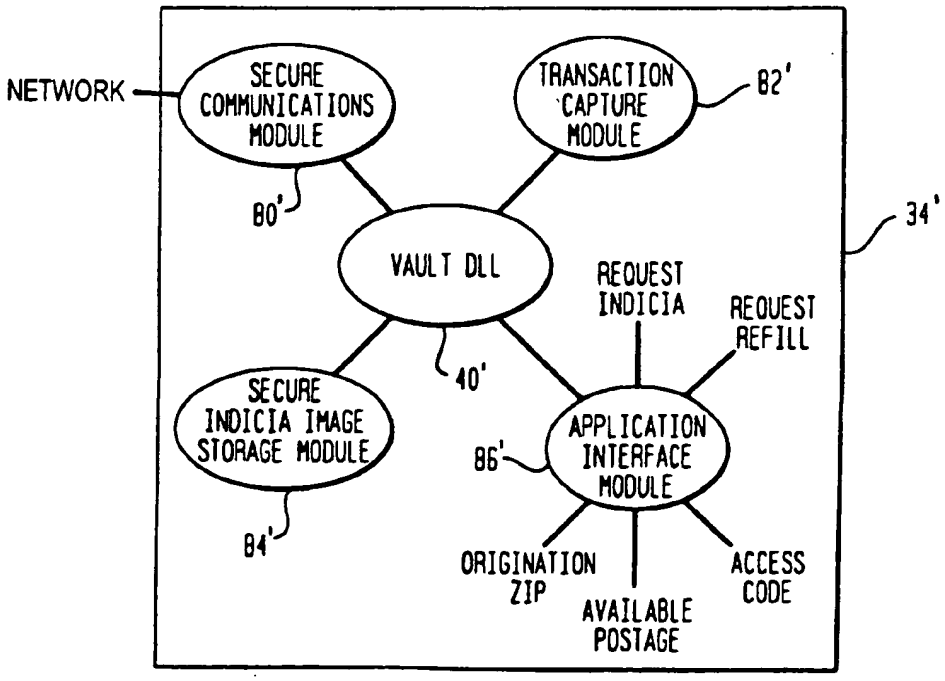

NETWORK
SECURE COMMUNICATIONS MODULE
80'
TRANSACTION CAPTURE MODULE
82'
34'
VAULT DLL
40'
REQUEST INDICIA
REQUEST REFILL
SECURE INDICIA IMAGE STORAGE MODULE
84'
APPLICATION INTERFACE MODULE
86'
ORIGINATION ZIP
AVAILABLE POSTAGE
ACCESS CODE

FIG. 5

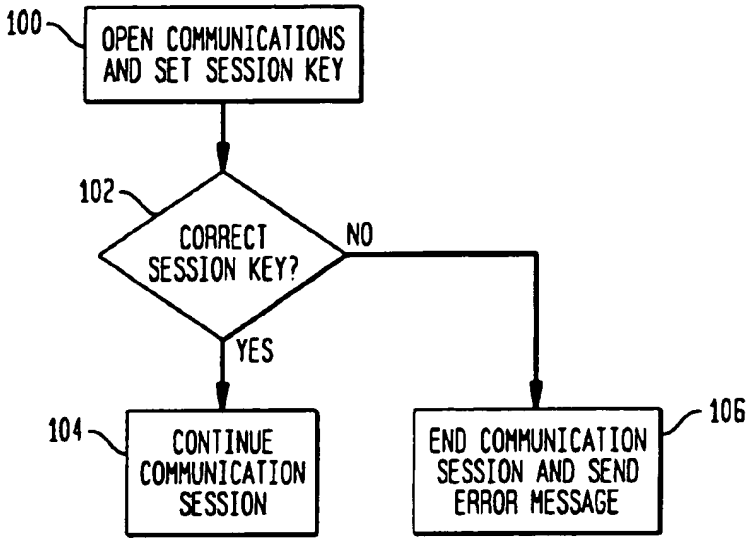

100
OPEN COMMUNICATIONS AND SET SESSION KEY
102
CORRECT SESSION KEY?
NO
YES
104
CONTINUE COMMUNICATION SESSION
END COMMUNICATION SESSION AND SEND ERROR MESSAGE
106

FIG. 6

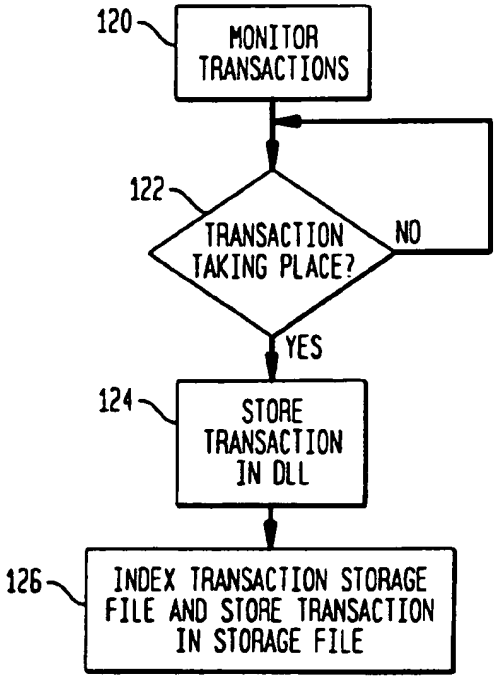

120
MONITOR TRANSACTIONS
122
TRANSACTION TAKING PLACE?
NO
YES
124
STORE TRANSACTION IN DLL
126
INDEX TRANSACTION STORAGE FILE AND STORE TRANSACTION IN STORAGE FILE

FIG. 7

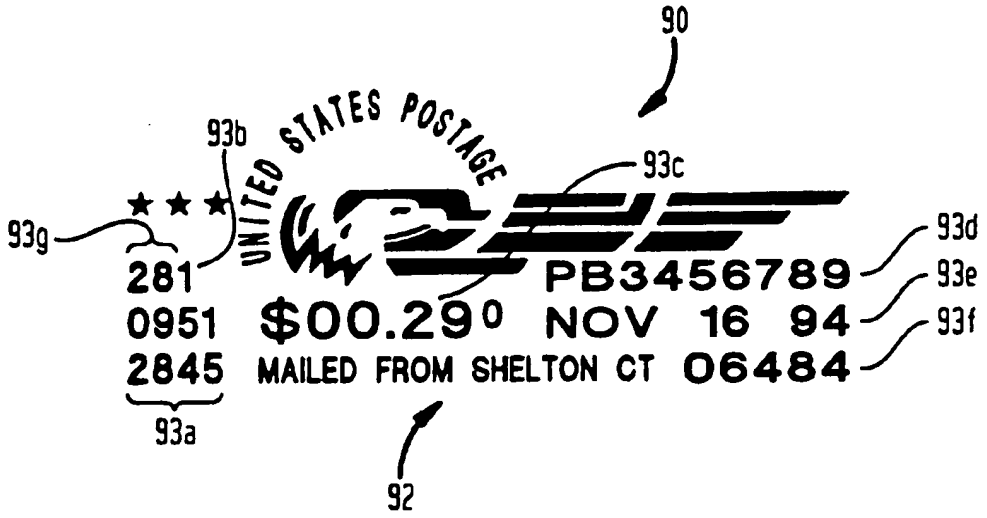

90
93b
UNITED STATES POSTAGE
93c
93g
★ ★ ★
281
PB3456789
93d
0951 $00.290 NOV 16 94
93e
2845 MAILED FROM SHELTON CT 06484
93f
93a
92

FIG. 8

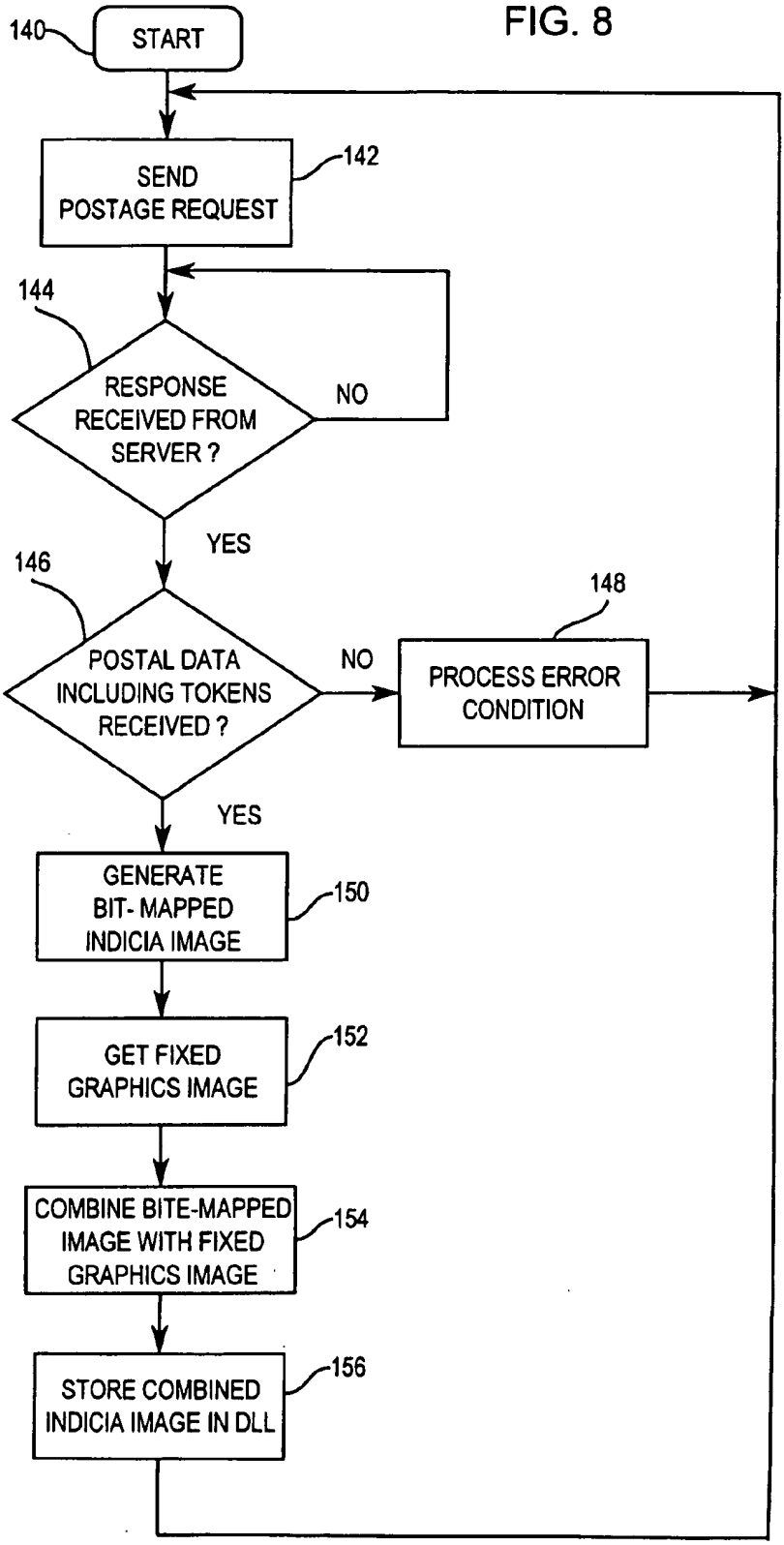
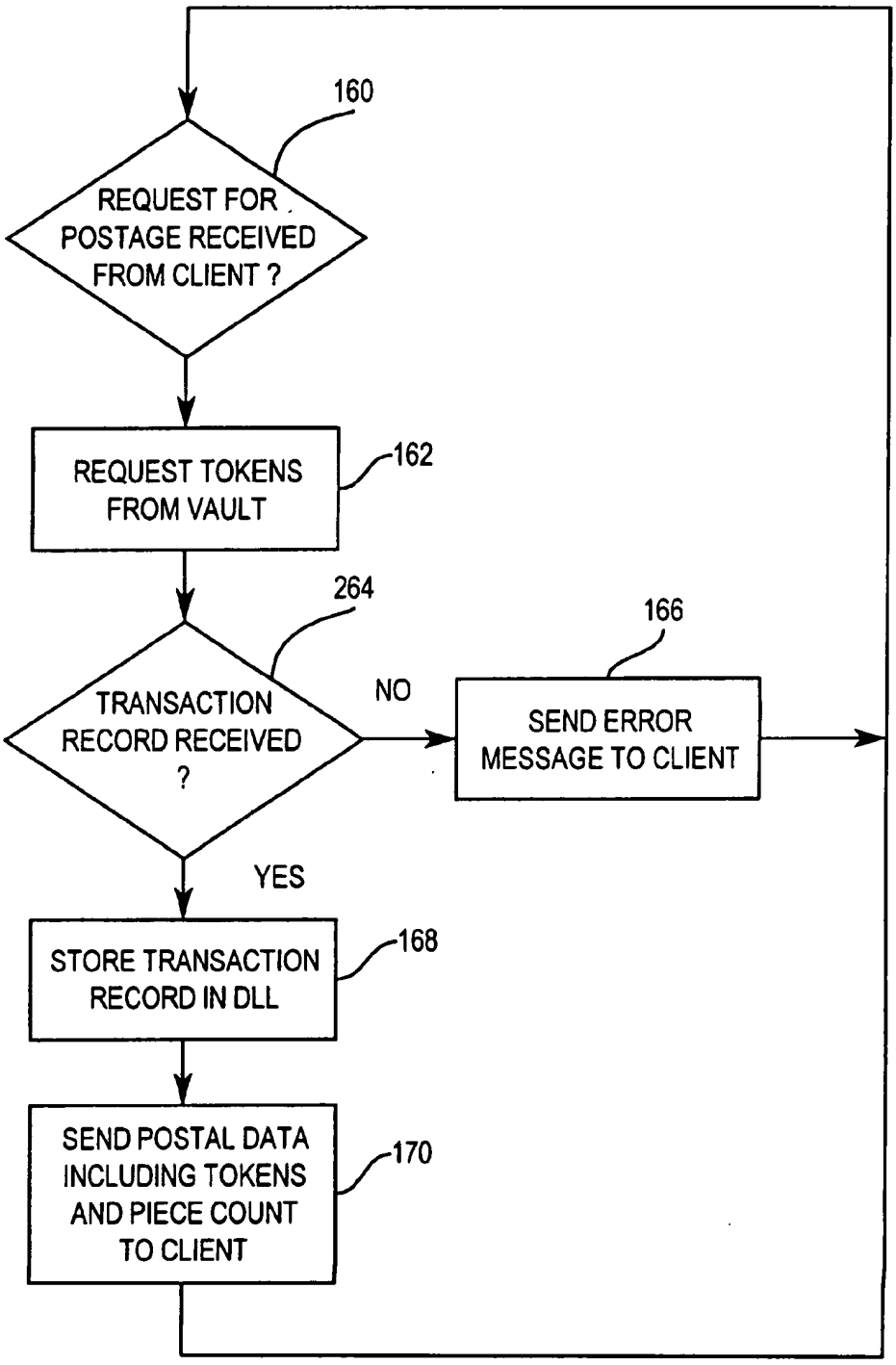

140
START
SEND POSTAGE REQUEST
142
144
RESPONSE RECEIVED FROM SERVER ?
NO
YES
146
POSTAL DATA INCLUDING TOKENS RECEIVED ?
148
NO
PROCESS ERROR CONDITION
YES
GENERATE BIT- MAPPED INDICIA IMAGE
150
GET FIXED GRAPHICS IMAGE
152
COMBINE BITE-MAPPED IMAGE WITH FIXED GRAPHICS IMAGE
154
STORE COMBINED INDICIA IMAGE IN DLL
156

FIG. 9


160
REQUEST FOR POSTAGE RECEIVED FROM CLIENT ?
REQUEST TOKENS FROM VAULT
162
264
TRANSACTION RECORD RECEIVED ?
NO
166
SEND ERROR MESSAGE TO CLIENT
YES
STORE TRANSACTION RECORD IN DLL
168
SEND POSTAL DATA INCLUDING TOKENS AND PIECE COUNT TO CLIENT
170

NETWORK OPEN METERING SYSTEM

RELATED APPLICATIONS

The present application is related to the following U.S. patent applications Ser. Nos. 08/575,106, now U.S. Pat. No. 5,625,694 issued on Apr. 29, 1997, 08/575,107; now U.S. Pat. No. 5,781,438 issued on Jul. 14, 1998; 08/574,746; now U.S. Pat. No. 5,835,604 issued on Nov. 10, 1998; 08/574,745; now U.S. Pat. No. 5,742,683 issued on Apr. 21, 1998; 08/575,110; 08/574,743; now U.S. Pat. No. 5,793,867 issued on Aug. 11, 1998; 08/575,112; 08/575,104; now U.S. Pat. No. 5,835,689 issued on Nov. 10, 1998; 08/574,749; now U.S. Pat. No. 5,590,198 issued on Dec. 31, 1996, and 08/575,111 now abandoned, each filed concurrently herewith, and assigned to the assignee of the present invention.

FIELD OF THE INVENTION

The present invention relates generally to value printing systems and, more particularly, to value printing systems wherein a printer is not dedicated to a metering module.

BACKGROUND OF THE INVENTION

Postage metering systems are being developed which employ digital printers to print encrypted information on a mailpiece. Such metering systems are presently categorized by the USPS as either closed systems or open systems. In a closed system, the system functionality is solely dedicated to metering activity. A closed system metering device includes a dedicated printer securely coupled to a metering or accounting function. In a closed system, since the printer is securely coupled and dedicated to the meter, printing cannot take place without accounting. In an open metering system the system functionality is not dedicated solely to metering activity. An open system metering device includes a printer that is not dedicated to the metering activity, thus freeing system functionality for multiple and diverse uses in addition to the metering activity. An open system metering device is a postage evidencing device (PED) with a non-dedicated printer that is not securely coupled to a secure accounting module.

Typically, the postage value for a mailpiece is encrypted together with other data to generate a digital token which is then used to generate postage indicia that is printed on the mailpiece. A digital token is encrypted information that authenticates the information imprinted on a mailpiece including postal value. Examples of systems for generating and using digital tokens are described in U.S. Pat. No. 4,757,537, 4,831,555, 4,775,246, 4,873,645 and 4,725,718, the entire disclosures of which are hereby incorporated by reference. These systems employ an encryption algorithm to encrypt selected information to generate at least one digital token for each mailpiece. The encryption of the information provides security to prevent altering of the printed information in a manner such that any misuse of the tokens is detectable by appropriate verification procedures.

Typical information which may be encrypted as part of a digital token includes origination postal code, vendor identification, data identifying the PED, piece count, postage amount, date, and, for an open system, destination postal code. These items of information, collectively referred to as Postal Data, when encrypted with a secret key and printed on a mail piece provide a very high level of security which enables the detection of any attempted modification of a postal revenue block or a destination postal code. A postal revenue block is an image printed on a mail piece that includes the digital token used to provide evidence of postage payment. The Postal Data may be printed both in encrypted and unencrypted form in the postal revenue block. Postal Data serves as an input to a Digital Token Transformation which is a cryptographic transformation computation that utilizes a secret key to produce digital tokens. Results of the Digital Token Transformation, i.e., digital tokens, are available only after completion of the Accounting Process.

Digital tokens are utilized in both open and closed metering systems. However, for open metering systems, the non-dedicated printer may be used to print other information in addition to the postal revenue block and may be used in activity other than postage evidencing. In an open system PED, addressee information is included in the Postal Data which is used in the generation of the digital tokens. Such use of the addressee information creates a secure link between the mailpiece and the postal revenue block and allows unambiguous authentication of the mail piece.

SUMMARY OF THE INVENTION

In accordance with the present invention an network-based open metering system is provided wherein some of the functionality typically performed in the vault of a conventional postage meter has been removed from the vault of the network-based open metering system and is performed in server and client PCs in the network. It has been discovered that this transfer of functionality from the vault to the PCs does not effect the security of the meter because the security of the network-based open metering system is in the information being processed.

Thus, the present invention provides a network-based open metering system that comprises a conventional network of a server PC and a plurality of client PC's, special Windows-based software in the server PC and each of client PC's, and a plug-in peripheral as a vault to store postage funds. The network-based meter uses the client PC's and their non-secure and nondedicated printers to print postage on envelopes and labels at the same time it prints a recipient address. The present invention provides access to an metering system by multiple users that are geographically separated, for example at different offices within a building.

The present invention provides a network-based open meter system, which consists of a personal computer (PC) network, a digital printer operatively connected to each PC in the network, a removable electronic vault operatively connected to the server PC, an optional modem for funds recharge (debit or credit), PC software modules in the form of a Dynamic Link Library (DLL) and a user interface module in each PC. The vault is a secure encryption device for digital token generation, funds management and traditional accounting functions. The DLL module in the client initiates all communications with the DLL in the server PC which communicates with the vault, and provides an open interface to Windows-based applications. Secure communication between the client PC and the vault is desired but is not necessary for system security. The DLL module in the server PC obtains from the vault transaction records comprising digital tokens issued by the vault and associated postal data and sends the transaction record to the client PC which then generates an electronic indicia image. The usage of postal funds and the transaction record are stored in the vault. Another copy of the usage of postal funds and the transaction record may be stored on the server and client hard drives as backup. The user interface module obtains the electronic indicia image from the DLL module for printing

the postal revenue block on a document, such as an envelope. The user interface also communicates with the vault via the DLL in the server PC for remote refills and for performing administrative functions.

The present invention further provides open system network metering that includes security to prevent tampering and false evidence of postage payment as well 4as the ability to do batch processing of envelopes, review of indicia and addressing on envelope before printing.

DESCRIPTION OF THE DRAWINGS

The above and other objects and advantages of the present invention will be apparent upon consideration of the following detailed description, taken in conjunction with accompanying drawings, in which like reference characters refer to like parts throughout, and in which:

FIG. **1** is a block diagram of a PC-Network metering system in accordance with the present invention;

FIG. **2** is a schematic block diagram of the PC-Network metering system of FIG. **1** including a removable vault card in a server PC and a DLL in each of the PC's;

FIG. **3** is a schematic block diagram of the client and server PC's in the PC-Network metering system of FIG. **1** including interaction with the vault to generate indicia bitmap;

FIG. **4**. (4A–4B)' is a block diagram of the DLL sub-modules in the PC-Network metering system of FIG. 1;

FIG. **5** is a flow chart of the Secure Communications sub-module in the PC-Network metering system of FIG. 1;

FIG. **6** is a flow chart of the Transaction Capture sub-module in the PC-Network metering system of FIG. 1;

FIG. **7** is an representation of indicia printed by the PC-Network metering system of FIG. 1;

FIG. **8** is a flow chart of the client requesting an indicia in the PC-Network metering system of FIG. 1; and

FIG. **9** is a flow diagram of the server responding to a request for an indicia in the PC-Network metering system of FIG. **1**.

DETAILED DESCRIPTION OF THE PRESENT INVENTION

In describing the present invention, reference is made to the drawings, wherein there is seen in FIGS. **1–3** an open system network-based postage meter, also referred to herein as a network-based metering system, generally referred to as **1**, comprising a server **10** and a plurality of clients **11**. Server **10** is configured to operate as a host to a removable metering device or electronic vault, generally referred to as **20**, in which postage funds are stored.

In the following description and in the drawings, components common to server **10** and clients **11** are distinguished, when necessary, by referring to the client components with a prime designation. When the component functionality is common to both server and client PC's the description does not distinguish between server and client.

The server **10** and clients **11** include the following common components: a personal computer (PC) **12**, a display **14**, a keyboard **16**, and an unsecured digital printer **18**, preferably a laser or ink-jet printer. Each PC **12** includes a conventional processor **22**, such as the 80486 and Pentium processors manufactured by Intel, and conventional hard drive **24**, floppy drive(s) **26**, and memory **28**. Server **10** includes an electronic vault **20**, which is housed in a removable card, such as PCMCIA card **30**. Electronic vault **20** is a secure encryption device for postage funds management, digital token generation and traditional accounting functions. Server **10** may also include an optional modem **29** which is located in PC **12**, preferably, or in card **30**. Modem **29** may be used for communicating with a Postal Service or a postal authenticating vendor for recharging funds (debit or credit). A description of such communication by modem is described in U.S. Pat. No. 4,831,555, incorporated herein by reference. In an alternate embodiment the modem may be located in PCMCIA card **30**.

Each of the PC's **12** includes a Windows-based PC software module **34** (FIGS. **3** and **4**) that is accessible from conventional Windows-based word processing, database and spreadsheet application programs **36**. PC software module **34** includes a dynamic link library (DLL) **40**, a user interface module **42** (FIG. **2**), and a plurality of sub-modules that control the metering functions. In server **10**, DLL module **40** securely communicates with vault **20** and clients **11**. In client **11**, DLL module **40'** securely communicates with server **10**. DLL **40**, in server **10** and client **11**, provides an open interface to Microsoft Windows-based application programs **36** through user interface module **42**. DLL module **40** also securely stores transaction records reflecting the usage of postal funds of vault **20**. User interface module **42** provides application programs **36** access to an electronic indicia image from DLL module **40** for printing the postal revenue block on a document, such as an envelope or label. User interface module **42** also provides application programs the capability to initiate remote refills and to perform administrative functions.

Thus, network-based metering system **1** operates as a conventional network, except that a client or network printer prints postage upon user request. Printers **18** print all documents normally printed by a personal computer, including printing letters and addressing envelopes, and in accordance with the present invention, prints postage indicia. Network-based meter system **1** uses server **10** to issue postage and one of the printers to print the issued postage on envelopes at the same time it prints a recipient's address or to print labels for pre-addressed return envelopes or large mailpieces. It will be understood that although the preferred embodiment of the present invention is described as a postage metering system, the present invention is applicable to any value metering system that includes transaction evidencing. It will also be understood that the present invention could also be used in a network in which a network printer, such as the server printer, is used to print envelopes with indicia, when local printers are not available to some or all of the client PC's.

A description of the key components of network-based metering system **1** are described below followed by a description of the preferred operation of network-based metering system **1**.

The Vault

In the preferred embodiment of the present invention, the vault is housed in a PCMCIA I/O device, or card, which is accessed through a PCMCIA controller **32** in server **10**. A PCMCIA card is a credit card size peripheral or adapter that conforms to the standard specification of the personal Computer Memory Card International Association.

Referring now to FIGS. **2** and **3**, the PCMCIA card includes a microprocessor **44**, non-volatile memory (NVM) **46**, clock **48**, an encryption module **50** and an accounting module **52**. The encryption module **50** may implement the NBS Data Encryption Standard (DES) or another suitable

encryption scheme. In the preferred embodiment, encryption module **50** is a software module. It will be understood that encryption module **50** could also be a separate device, such as a separate chip connected to microprocessor **44**. Accounting module **52** may be EEPROM that incorporates ascending and descending registers as well as postal data, such as origination ZIP Code, vendor identification, data identifying server PC **12**, sequential piece count of the postal revenue block generated by the network-based metering system **1**, postage amount and the date of submission to the Postal Service. As is known, an ascending register in a metering unit records the amount of postage that has been dispensed, i.e., issued by the vault, in all transactions and the descending register records the value, i.e., amount of postage remaining in the vault, which value decreases as postage is issued.

The hardware design of the vault includes an interface **56** that communicates with the server host processor **22** through PCMCIA controller **32**. Preferably, for added physical security, the components of vault **20** that perform the encryption and store the encryption keys (microprocessor **44**, ROM **47** and NVM **46**) are packaged in the same integrated circuit device/chip that is manufactured to be tamper proof. Such packaging ensures that the contents of NVM **46** may be read only by the encryption processor and are not accessible outside of the integrated circuit device. Alternatively, the entire card could be manufactured to be tamper proof.

In accordance with the present invention, the open system vault **20** is strictly a slave device in PC **12** of server **10**. Server host processor **22** generates a command and vault **20** replies with a response. Vault **20** does not generate unsolicited messages. Thus, server PC **12** requests vault status whenever any transaction is initiated. A further description of vault **20** is disclosed in the related U.S. patent application Ser. No. 08/575,112, previously noted, which is incorporated herein in its entirety by reference. Dynamic Link Library Control of the Vault and Network Communications

In accordance with the present invention, the functionality of DLL's **40** and **40'** in server and client PC's, respectively, is a key component of network-based metering **1**. DLL **40** includes both executable code and data storage area **41** that is resident in hard drive **24** of PC **12**. In a Windows environment, a vast majority of applications programs **36**, such as word processing and spreadsheet programs, communicate with one another using one or more dynamic link libraries. The present invention encapsulates all the processes involved in metering, and provides an open interface to vault **20** from all Windows-based applications capable of using a dynamic link library. In accordance with the present invention, any client application program **36'** can communicate with vault microprocessor **44** in PCMCIA card through DLL **40'** and server PC **12**.

In accordance with the present invention, DLL **40** includes the following software sub-modules: secure communications **80**, transaction captures **82**, secure indicia image creation and storage **84**, and application interface module **86**.

Secure Communications

Since vault **20** is not physically secured to server PC **12**, it may be possible for that one vault **20** attached to server PC **12** is replaced with another vault **20** while a vault transaction is in process. The Secure Communications sub-module **80** prevents this from happening by maintaining secure communication between server DLL **40** and vault **20**. Secure Communications sub-module **80** in server **11** identifies a specific vault **20** when it opens a communication session through PCMCIA controller **32**, and maintains communication data integrity with the specific vault during the entire communication session. Similarly, when a communication session is initiated between client **11** and a server **10**, Secure Communications sub-module **80** maintains communication data integrity between the client **11** and server **10**. Refering now to FIG. **5**, when a communication session is initiated, between server DLL **40** and vault **20**, or between client **11** and server **10**, a session key is negotiated at step **100**. All the messages thereafter are encoded/decoded using the session key which is used for only the one particular communication session. Whenever the session key changes during the communication session, the communication session terminates and an error message is sent to the user at step **106**. The use of session keys is described in Applied Cryptography by Bruce Schneier, published by John Wiley and Sons, Inc., 1994. Thus, the session key not only provides secure encrypted communication during a token request and issue, but also prevents another vault (PCMCIA card **30**) from replacing the vault **20** that began a communication session, because the other vault does not have the session key negotiated at the beginning of the communication session. The secure communications between server **10** and client **11** ensures that only the client requesting a token can receive the token. Secure Communications sub-module **80** in server **11** also controls secure communications with the postal data center, for example, during refills of the accounting registers in vault **20**.

Transaction Captures

Conventional postage meters store transactions in the meter. In accordance with the present invention, Transaction Capture sub-module **82** in server **10** captures each transaction record received from vault **20** and records the transaction record in DLL **40** and in DLL storage area **41** on hard drive **24**. When server **10** sends the transaction record to client **11**, Transaction Capture sub-module **82'** in client **11** captures the transaction record and records the transaction record in DLL **40'** and in DLL storage area **41'** on hard drive **24'**. Referring now to FIG. **6**, from the moment that a communication session is established, between server DLL **40** and vault **20**, or between client **11** and server **10**, respective Transaction Capture submodules **82** and **82'** monitor message traffic at step **120**, selectively capture each transaction record for token generations and refills, and store such transaction records in respective DLLs **40** and **40'** at step **124** and in an invisible and write-protected files **83** and **83'** in DLL storage areas **41** and **41'** at step **126**. The information stored for each transaction record includes, for example, vault serial number, date, piece count, postage, postal funds available (descending register), tokens, destination postal code and the block check character. A predetermined number of the most recent records initiated can be stored in this manner by indexing files **83** and **83'** accordingly. In the preferred embodiment files **83** and **83'** are indexed according to piece count but may searched according to addressee information. Server file **83** represents the mirror image of vault **20** at the time of the transaction except for the encryption keys and configuration parameters. Client file **83'** may represent a subset of the image of vault **20** at the time of the transaction because each client **11** stores transaction records of transactions initiated by such client. Storing transaction records on hard drive **24** provides backup capability which is described below.

A description of a digital token generation process is disclosed for a PC-meter system in the related U.S. Patent

Applications Serial Nos. [Attorney Dockets E-416, E-415 and E-419], which are incorporated herein in their entirety by reference. The digital token generation process for network-based metering system **1** is the same as described in the related applications except that a client application program **36'** sends a request for digital token to vault **20** through client DLL **40'** and server DLL **40** as shown in FIG. **3**. The generated token is sent to the client DLL **40'** through the server DLL **40** for use in generating an indicia. In the present invention, when a request for token is sent from a client to server **10**, all postal information that is needed to calculate the token as well as parameters identifying the client, such as user ID, password and client PC identification, must accompany the request since multiple clients may be requesting tokens simultaneously.

Indicia Image Creation and Storage

In a closed metering system, such as conventional postage meters, the indicia is secure because the indicia printer is dedicated to the meter activity and is physically secured to the accounting portion of the meter, typically in a tamper-proof manner. In an open metering system, such as the present invention, such physical security is not present.

In accordance with the present invention, the entire fixed graphics image **90** of the indicia **92**, shown in FIG. **7** is stored as compressed data **94** in DLL storage area **41**. Postal data information, including piece count **93***a*, vendor ID **93***b*, postage amount **93***c*, serial number **93***d*, date **93***e* and origination ZIP **93***f* and tokens **93***g* are combined with the fixed graphics image **90** by Indicia Image Creation and Storage sub-module **84**.

Referring now to FIGS. **3** and **8**, a request for indicia is made, at step **142**, from application program **36'** in client **11** to server **10**. At step **144**, Secure Communications sub-module **80'** in client **11** checks for a response from server **10**, When a response is received, Indicia Image Creation and Storage sub-module **84'** checks, at step **146**, the response for postal data, including at least one digital token. If the postal data has not been sent with the response, at step **148**, an error condition is processed that results in a message to the user. If the response from server **10** included the expected postal data, at step **150**, Indicia Image Creation and Storage sub-module **84'** generates a bit-mapped indicia image **96** by expanding the compressed fixed graphics image data **94**, at step **152**, and combining, at step **154**, the indicia's fixed graphics image **90** with some or all of the postal data information and tokens received from vault **20**. At step **156**, the indicia image is stored in DLL **40'** for printing. Sub-module **84'** sends to the requesting application program **36'** in client PC **12'** the created bit-mapped indicia image **96** that is ready for printing, and then stores a transaction record comprising the digital tokens and associated postal data in DLL storage area **41'**.

Thus, the bit-mapped indicia image **96** is stored in DLL **40'** which can only be accessed by executable code in DLL **40'**. Furthermore, only the executable code of DLL **40'** can access the fixed graphics image **90** of the indicia to generate bit-mapped indicia image **96**. This prevents accidental modification of the indicia because it would be very difficult for a normal user to access, intentionally or otherwise, the fixed graphics image **90** of the indicia and the bit-mapped indicia image **96**.

Referring now to FIGS. **3** and **9**, when the request for indicia is made, from application program **36'**, Secure Communications sub-module **80** in server **10** checks for the request from client **11**, at step **160**. When the request is received, Secure Communications sub-module **80** requests tokens from vault **20**, at step **162**. At step **164**, Secure Communications sub-module **80** checks for a transaction record, including digital token, from vault **20**. If a transaction record is not received in response to the request from server **10**, an error is processed, at step **166**, resulting in an error message to client **11**. If a transaction record is received, then, at step **168**, the transaction record is stored in DLL **40** and DLL storage area **41**. At step **170**, Secure Communications sub-module **80** sends the postal data received as in the transaction record, including token and piece count, to client **11**.

The request for indicia most likely will originate from a client **11** but could originate from server **10**. When server **10** originates a request for indicia server **10** functions as a PC-based meter as described U.S. patent application Ser. No. 08/575,112, previously noted, which is hereby incorporated in its entirety by reference.

Application Interface

The Application Interface sub-module **86**, in server **10** or client **11**, provides the following services when requested by an application program **36** in PC **12**. Application program **36** accepts user data through user interface module **42** and prints indicia on an envelope or on a label. In the preferred embodiment of the present invention, such application program **36** would be an off-the-shelf software module, such as a word processor or spreadsheet, that can access DLL **40**. In an alternate embodiment application program **36** could be a software module dedicated solely to accept user data and print indicia on an envelope or on a label. Application Interface sub-module **86** provides the destination ZIP data and associated postal data needed to create the indicia. Application Interface sub-module **86** requests available postage from vault **20** and reports the available postage to the requesting application program **36**.

When vault **20** is refilled with postage funds from the data center, Application Interface sub-module **86** requests from vault **20** the access code required for refills and reports the access code received to the Secure Communications sub-module **80** which initiates communications with the data center. Application Interface sub-module **86** initiates the refill and provides the amount and combination to vault **20**. DLL **40** reports the result to the requesting application program **36** which acknowledges the refill to the user.

Application Interface sub-module **86** processes a request for indicia received from application program **36** and forwards the request to Indicia Image Creation and Storage sub-module **84**. Application Interface sub-module **86** provides postal data, including date, postage, and a destination postal code, such as an 11 digit ZIP code, to Indicia Image Creation and Storage sub-module **84** which then generates a bit-mapped indicia image **96**. Application Interface sub-module **86** reports to application program **36** that the bit-mapped indicia image **96** is ready for printing.

Backup On Hard Drive

Vault **20** must be a secure device because it contains the accounting information of the amount of postage remaining in the vault and the postage printed. However, the very nature of the security makes it hard to recover postal funds in the event a malfunction occurs and the vault cannot be accessed by normal operation. The present invention enhances the reliability of a PC meter system by using the hard disks of server **10** and clients **11** to backup the accounting information of the vault. As previously described, the

transaction capture sub-modules **82** and **82'** store transaction files as backup files on hard drives **24** and **24'**. This provides a benefit that certain functions, such as account reconciliation, can be performed even when vault **20** malfunctions. Such backup is unavailable in conventional postage meters.

For further security, the backup transaction files can be encrypted before being stored on hard drives **24** and **24'** to prevent tampering. The number of transactions that are maintained on hard drives **24** and **24'** is limited only by the available storage space on the hard drives. Preferably, at least all transactions since the last refill would be maintained on server **10** as backup.

A detailed description of recovery from vault malfunction is disclosed in co-pending U.S. patent application Ser. No. 08/574,743, previously noted, which is incorporated herein in its entirety by reference.

Operation of the PC Meter

Generally, the first action by a user after powering up a conventional meter is setting the time and date of the meter. Setting the date is necessary to generate derived keys which are used to generate the digital tokens. (Some recent meters have a real time clock internal to the meter in which case the time and date need only be set once.) The present invention spares the user from having to set the vault date.

As previously described, vault **20** does not have an independent power source and therefore cannot have a continuous running real-time clock. The date must be set every time the vault is powered-up. Power is applied to vault **20** only when it is plugged into server PC **12**. Thus, the date would normally be entered by the user through server PC **12** each time vault **20** is plugged into PCMCIA controller **32**. Since server PC **12** has a real-time clock, the date setting process may be automated and made transparent to the user. In accordance with the present invention, the time and date set in server PC **12** is sent to vault **20** each time power is initially applied to vault **20**. The vault date is used by DLLs **40** and **40'** to generate the indicia. The vault date may be changed at any time by the user to facilitate post-dating of mail.

Upon application of power to vault **20** by PCMCIA controller **32**, the date of server PC **12** is obtained through user interface **42**. The date is then translated into the correct format and sent to vault **20** which then sets its date, calculates its date dependent token keys and returns its status and the token keys to server PC **12**. Additionally, a default postage amount (e.g. First Class Postage) may be set in a similar manner. This method enables network-based metering system **1** immediately when vault **20** is plugged into PCMCIA controller **32** without the user having to manually set parameters. The user may change the vault date (in order to post date mail) or the default postage amount at any time.

In an alternate embodiment, PCMCIA card has its own internal clock that is automatically set with the time and date in server PC **12** each time PCMCIA card is inserted into PCMCIA controller **32**.

In the preferred operation, a user of an application program **36** (running in either client **11** or server **10**), such as a word processor, highlights a recipient address from a letter or mailing list displayed on display **14**. The user requests the printing of an envelope with indicia. A dialog box appears on display **14** indicating the default postage amount which the user may accept or modify. When the postage amount is accepted, the entire envelope is previewed with all addressing, bar-coding and indicia shown on the envelope. At this point the user can print the envelope as shown or correct any errors that are seen in the preview.

As previously described, in network-based metering system **1** the printers are not dedicated to the metering function and the indicia are stored in PC **12** before printing. Thus, tokens can be generated individually or for a batch of addressees stored in the requesting client **11** which can later generate indicia from each of the tokens and then print the indicia at the user's discretion. Such delayed printing and batch processing is described in more detail in co-pending U.S. patent application Ser. No. 08/575,104, previously noted, which is incorporated herein in its entirety by reference.

As with any document prepared in a Windows-based PC system, a user may observe, through the application program **36** in which an envelope was created, an image of a fully prepared envelope or batch of envelopes to be printed, including addressee information and indicia, before printing any of the envelopes. Network-based metering system **1** also provides a user with the ability to customize return addresses, slogans, logos and greetings that are to be printed with the indicia on the envelope.

In an alternate embodiment of network-based metering system **1**, the electronic vault is in an IC token, such as manufactured by CDSM of Phoenix, Ariz., that is inserted into a token receptacle of a PCMCIA card and programmed to operate as the vault in a similar manner as described for PCMCIA card **30**. In another alternate embodiment, the electronic vault is in a smart diskette, such as manufactured by SmartDisc Security Corp. of Naples, Florida, that is programmed to operate in a similar manner as described for PCMCIA card **30**. In another alternate embodiment of network-based metering system **1**, the electronic vault is a tamper proof, hardware peripheral, such as a dongle, that is attached to a serial, parallel or SCSI port of the PC.

As used herein, the term personal computer is used generically and refers to present and future microprocessing systems with at least one processor operatively coupled to user interface means, such as a display and keyboard, and storage media. The personal computer may be a workstation that is accessible by more than one user.

While the present invention has been disclosed and described with reference to a single embodiment thereof, it will be apparent, as noted above that variations and modifications may be made therein. It is, thus, intended in the following claims to cover each variation and modification that falls within the true spirit and scope of the present invention.

What is claimed is:

1. A transaction evidencing system including a plurality of computer systems operatively configured to form a network with one of the computer systems functioning as a server and the remaining computer systems functioning as clients, each of the computer systems including processor, memory, storage and user interface means, at least some of said storage means including a plurality of non-metering application programs that are selectively run on said client computer systems, at least one of said computer systems including an unsecured printer operatively coupled thereto for printing in accordance with said non-metering application programs, the system comprising:

a portable vault card that is removably coupled to said server computer system, said vault card including digital token generation means and transaction accounting means, said server computer system including means for removably coupling said vault card to said PC;

vault interface means for effecting communications between said portable vault means and said non-metering application program and for performing metering functions other than metering functions performed in said portable vault means, said vault interface means comprising:

an application interface module in said client computer systems for interfacing with said non-metering application program;

a communications module in said server computer system for communicating with said portable vault means;

an indicia image creation and storage module in said client computer systems for generating indicia bitmaps and storing said indicia bitmaps in said storage means; and

a transaction capture module for storing storage means transaction records generated in said portable vault means.

2. The transaction evidencing system of claim **1** wherein said application interface module issues a request for at least one digital token in response to a request for indicia from said non-metering application program, said request for digital token including predetermined information required by said token generation means, said communications module sends said request for digital token and said predetermined information to said portable vault means and receives from said portable vault means a transaction record including a digital token generated by said token generation means, said indicia image creation and storage module generates an indicia bitmap from said digital token and stores said indicia bit map, said transaction capture module stores said transaction record said application interface module provides said indicia bitmap to said non-metering application program.

3. The transaction evidencing system of claim **2** wherein said transaction capture module in said server and client computer systems.

4. The transaction evidencing system of claim **2** wherein said indicia bitmap generating means generates a postage indicia bitmap by combining indicia graphics stored in said storage means of said requesting client computer system with said digital token and said predetermined information.

5. The transaction evidencing system of claim **2**, wherein a batch of digital tokens may be generated in the vault card and stored in a requesting one of said client computer systems before any indicia bitmaps corresponding to said batch of digital tokens are generated.

6. The transaction evidencing system of claim **2**, wherein said transaction record is encrypted before being stored in said storage means of said server computer system.

7. The transaction evidencing system of claim **2**, wherein said vault interface means provides said indicia bitmap to said one of said non-metering application programs for viewing an image of said indicia bitmap on a display coupled to said requesting client computer system before printing said indicia bitmap.

8. The transaction evidencing system of claim **1**, wherein a plurality of consecutive ones of said transaction records are stored in said storage means of said server computer system as backup to information stored in said vault card.

9. The transaction evidencing system of claim **1** wherein said transaction capture module in said server computer system.

10. The transaction evidencing system of claim **1**, wherein said vault interface means are part of dynamic link library modules in said computer systems.

11. The transaction evidencing system of claim **1**, wherein said vault card is a PCMCIA card.

12. A method of implementing a transaction evidencing system on a computer network comprising a plurality of computer systems operatively configured to form the computer network with one of the computer systems functioning as a server and the remaining computer systems functioning as clients, the method comprising the steps of:

providing a portable vault that is operatively coupled to the server, said vault operating as a secure accounting module of the transaction evidencing system;

requesting indicia in one of the clients for a particular document being processed in a non-metering application program running in the requesting client;

sending the request for indicia from the requesting client to the server with a predetermined set of information relating to the particular document;

sending, in response to said request for indicia, a request for at least one digital token from the server to the portable vault with the predetermined set of information;

issuing in said portable vault at least one digital token and sending the digital token as part of a transaction record to the server;

storing the transaction record in the server;

sending from the server to the requesting client the transaction record;

storing the transaction record in the client;

generating an indicia bitmap using the digital token and the predetermined set of information in the client; and

providing the indicia bitmap to the non-metering application program when the non-metering application program is ready to print the indicia.

13. The method of claim **12**, comprising the further steps of:

selecting in the non-metering application program recipient address information for use in the application program;

selecting in the non-metering application program an amount of postage to be printed on in the application program;

including the recipient address information and the amount of postage as part of the predetermined set of information; and

printing said recipient address and said indicia on an envelope.

14. The method of claim **12**, comprising the further step of:

storing a plurality of transaction records in a file on a hard drive of the server, and indexing the transaction records according to piece count.

15. The method of claim **12**, comprising the further step of:

viewing on a display coupled to the requesting client computer system an image of at least a part of the particular document with the indicia shown thereon before printing the particular document.

* * * * *

US006049775A

United States Patent [19]

Gertner et al.

[11] Patent Number: 6,049,775

[45] Date of Patent: Apr. 11, 2000

[54] **SYSTEMS, METHODS AND COMPUTER PROGRAM PRODUCTS FOR MONITORING AND CONTROLLING MAIL PROCESSING DEVICES**

[75] Inventors: **Patricia A. Gertner**, Raleigh; **William A. Sterling**, Cary; **Richard C. Nardin**, Apex, all of N.C.

[73] Assignee: **Bell & Howell Mail and Messaging Technologies Company**, Durham, N.C.

[21] Appl. No.: **09/079,620**

[22] Filed: **May 15, 1998**

Related U.S. Application Data

[63] Continuation-in-part of application No. 09/016,715, Jan. 30, 1998.

[60] Provisional application No. 60/085,479, May 14, 1998.

[51] **Int. Cl.**[7] **G06F 17/60**; G05B 15/02

[52] **U.S. Cl.** **705/8**; 345/326; 345/333; 345/334; 700/9; 700/11; 700/17; 700/95; 700/100

[58] **Field of Search** 345/326, 333, 345/334, 348; 364/138, 140.01, 146, 188, 191, 192, 400, 468.01, 468.06, 468.09; 705/1, 7, 8, 9; 700/9, 11, 17, 95, 100

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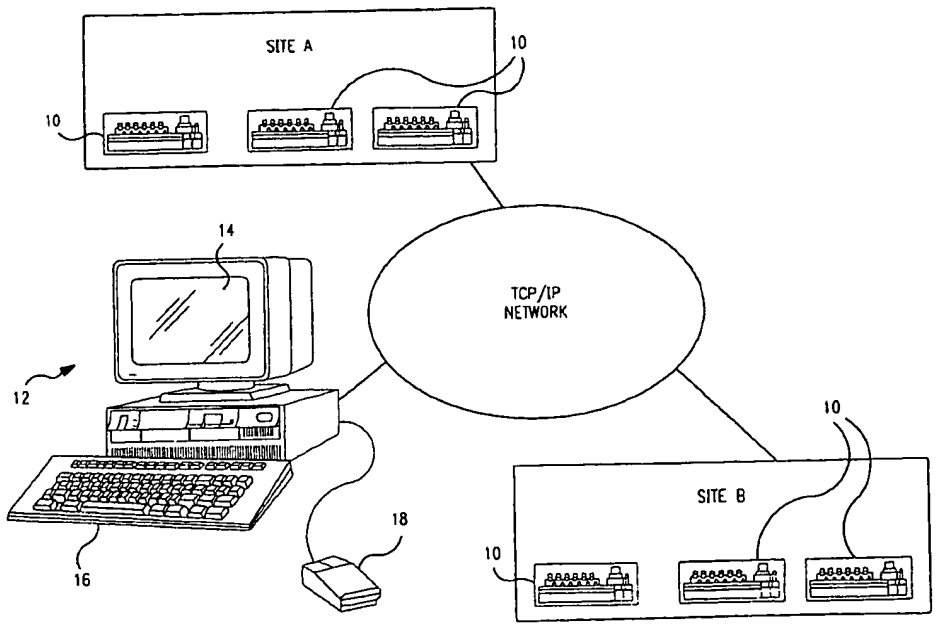
Primary Examiner—Edward R. Cosimano

Attorney, Agent, or Firm—Jenkins & Wilson, P.A.

[57] **ABSTRACT**

A system, method, device, and/or computer program product for remotely managing a plurality of remote mail processing devices. The system comprises receiving means for receiving operation related information from each of said plurality of remote mail processing devices. The system also includes monitoring means for remotely monitoring operation related information from each of said plurality of remote mail processing devices. Features of the present invention include the ability to create threshold settings for separate mail processing devices and individual jobs running on the separate mail processing devices. Violations of the threshold settings will result in an alarm indicating deviation from pre-set job goals. A user also has the ability to remotely create, maintain, and communicate valid mail processing device operator lists for specified mail processing devices. A run-tag editor is included which allows the user remotely access a stored database of completed job information in order to correct any job identification errors that may have been input by a mail processing device operator.

54 Claims, 17 Drawing Sheets



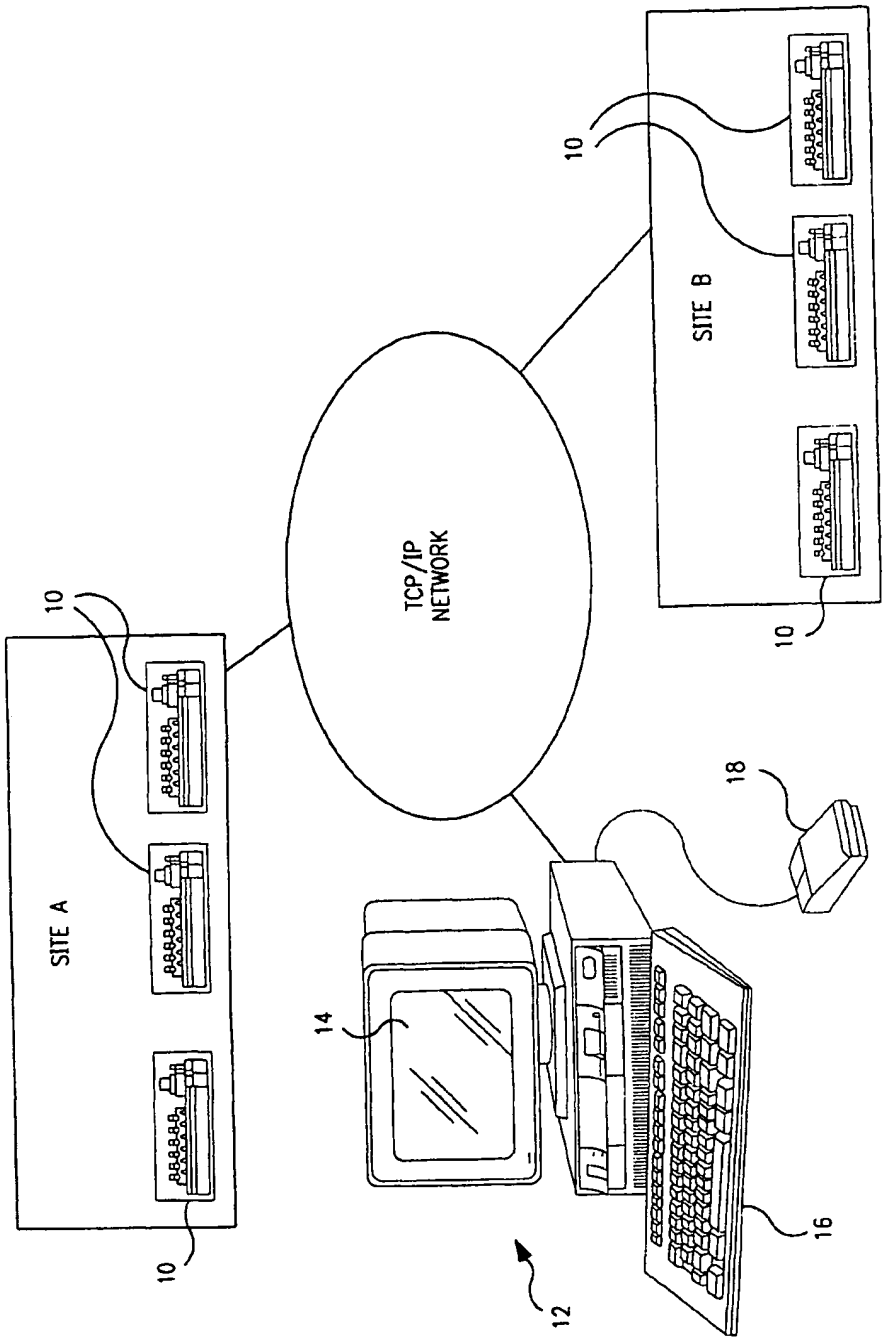


FIG. 1

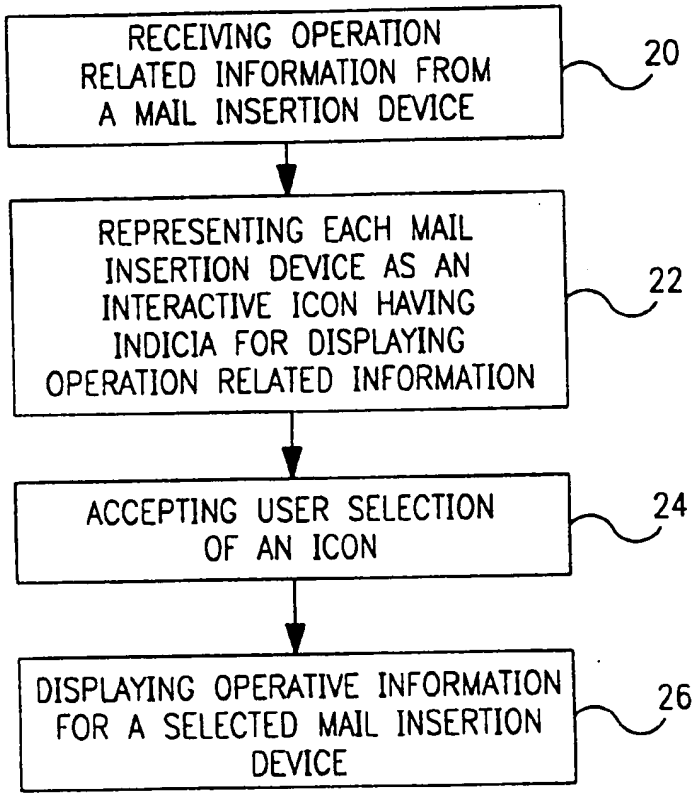

RECEIVING OPERATION RELATED INFORMATION FROM A MAIL INSERTION DEVICE
20
REPRESENTING EACH MAIL INSERTION DEVICE AS AN INTERACTIVE ICON HAVING INDICIA FOR DISPLAYING OPERATION RELATED INFORMATION
22
ACCEPTING USER SELECTION OF AN ICON
24
DISPLAYING OPERATIVE INFORMATION FOR A SELECTED MAIL INSERTION DEVICE
26

FIG. 2

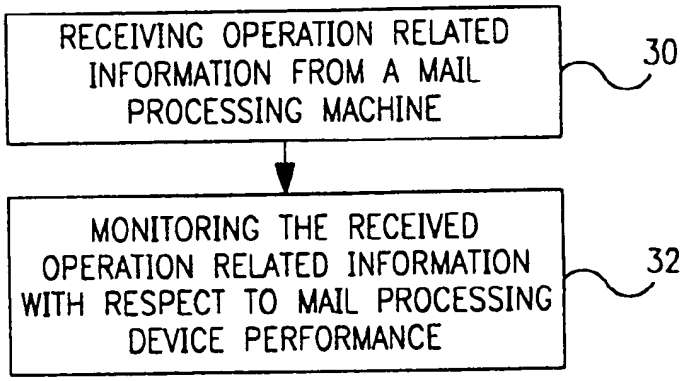

RECEIVING OPERATION RELATED INFORMATION FROM A MAIL PROCESSING MACHINE
30
MONITORING THE RECEIVED OPERATION RELATED INFORMATION WITH RESPECT TO MAIL PROCESSING DEVICE PERFORMANCE
32

FIG. 3

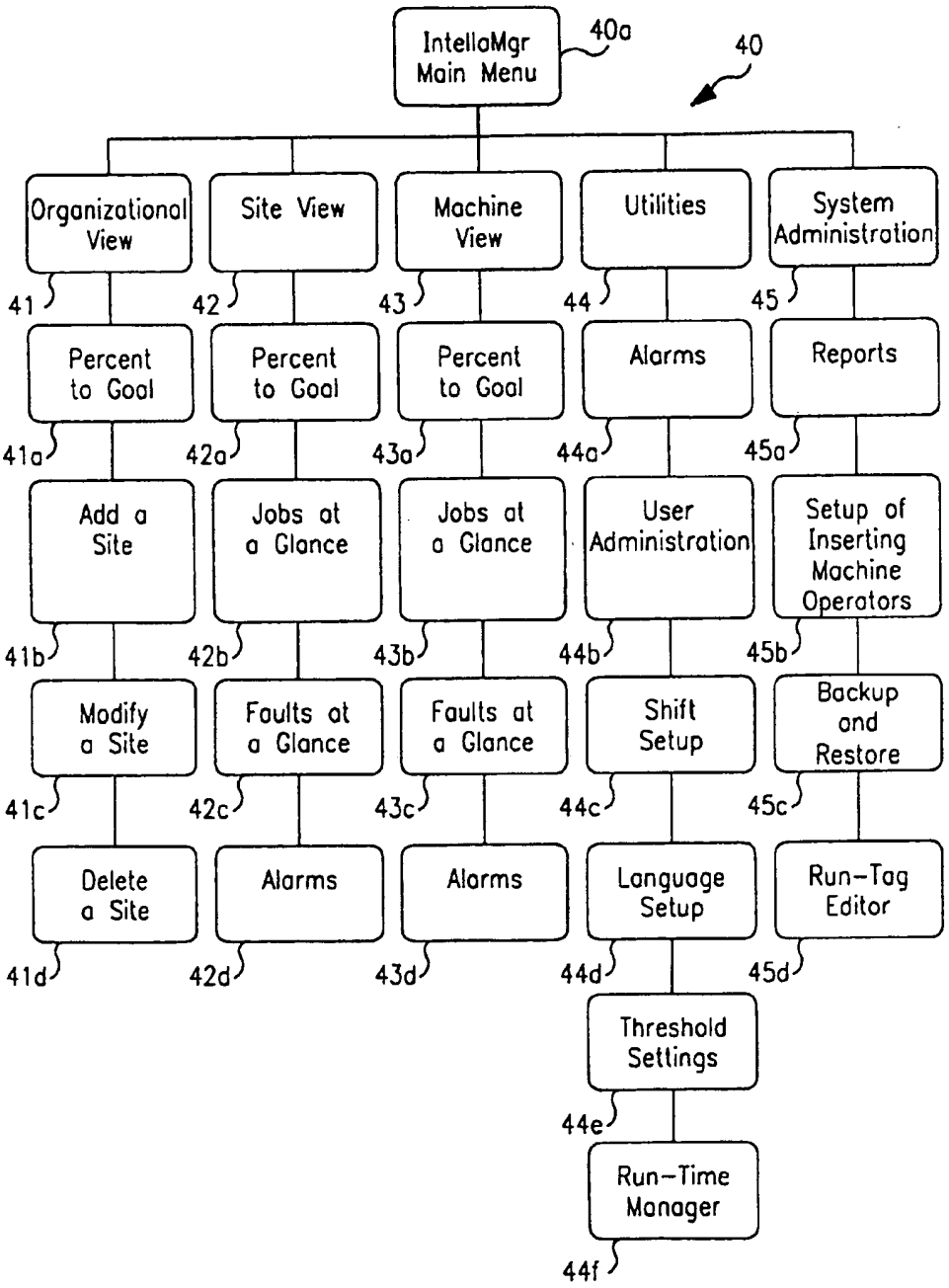

IntellaMgr Main Menu
40a
40
Organizational View
Site View
Machine View
Utilities
System Administration
41
42
43
44
45
Percent to Goal
Percent to Goal
Percent to Goal
Alarms
Reports
41a
42a
43a
44a
45a
Add a Site
Jobs at a Glance
Jobs at a Glance
User Administration
Setup of Inserting Machine Operators
41b
42b
43b
44b
45b
Modify a Site
Faults at a Glance
Faults at a Glance
Shift Setup
Backup and Restore
41c
42c
43c
44c
45c
Delete a Site
Alarms
Alarms
Language Setup
Run-Tag Editor
41d
42d
43d
44d
45d
Threshold Settings
44e
Run-Time Manager
44f

FIG. 4

FIG. 5

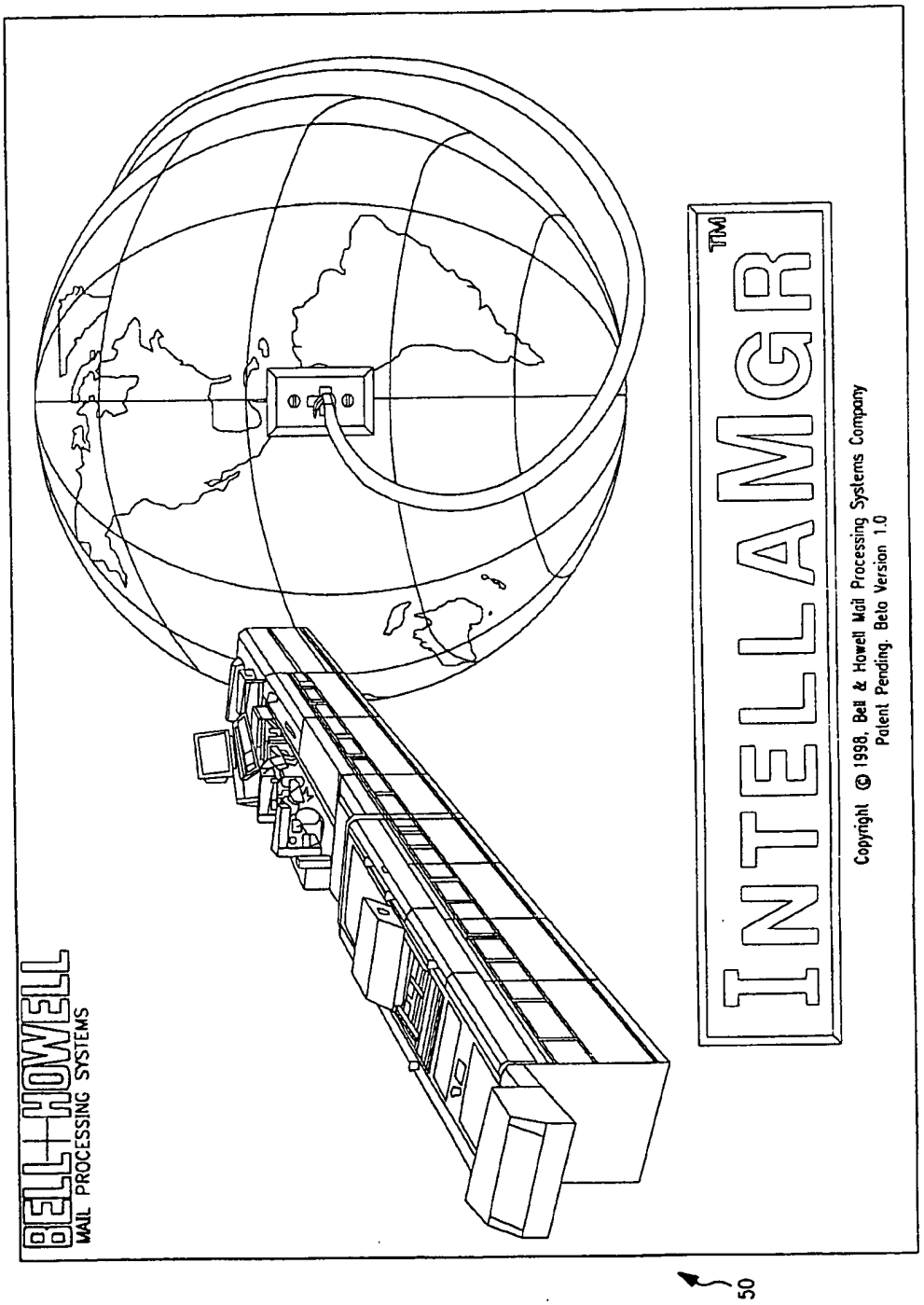
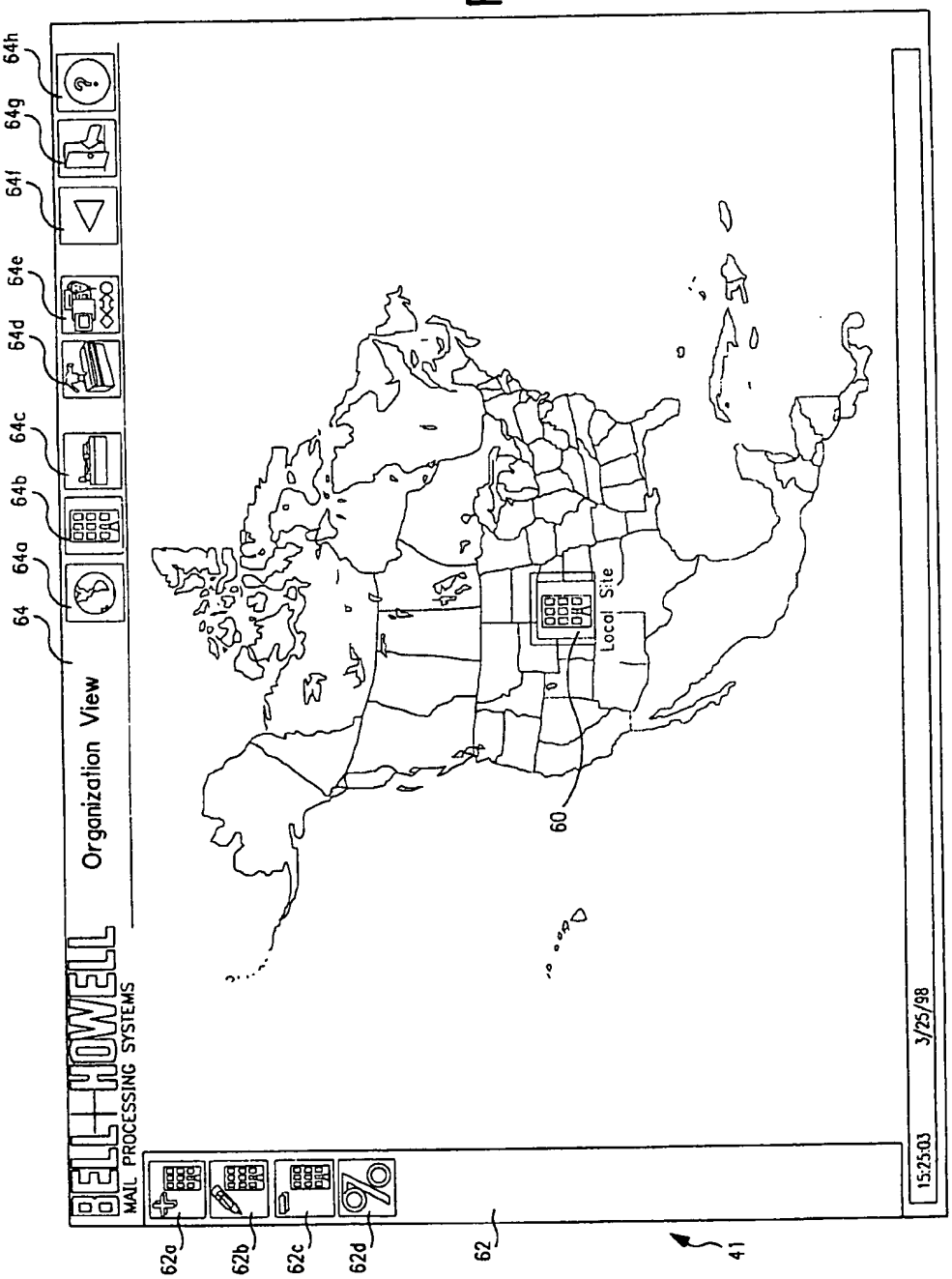

BELL+HOWELL
MAIL PROCESSING SYSTEMS
INTELLAMGR
TM
Copyright © 1998, Bell & Howell Mail Processing Systems Company
Patent Pending. Beta Version 1.0
50

FIG. 6


BELL+HOWELL
MAIL PROCESSING SYSTEMS
Organization View
Local Site
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3/25/98
64
64a
64b
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64e
64f
64g
64h
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62
62a
62b
62c
62d
41

FIG. 7

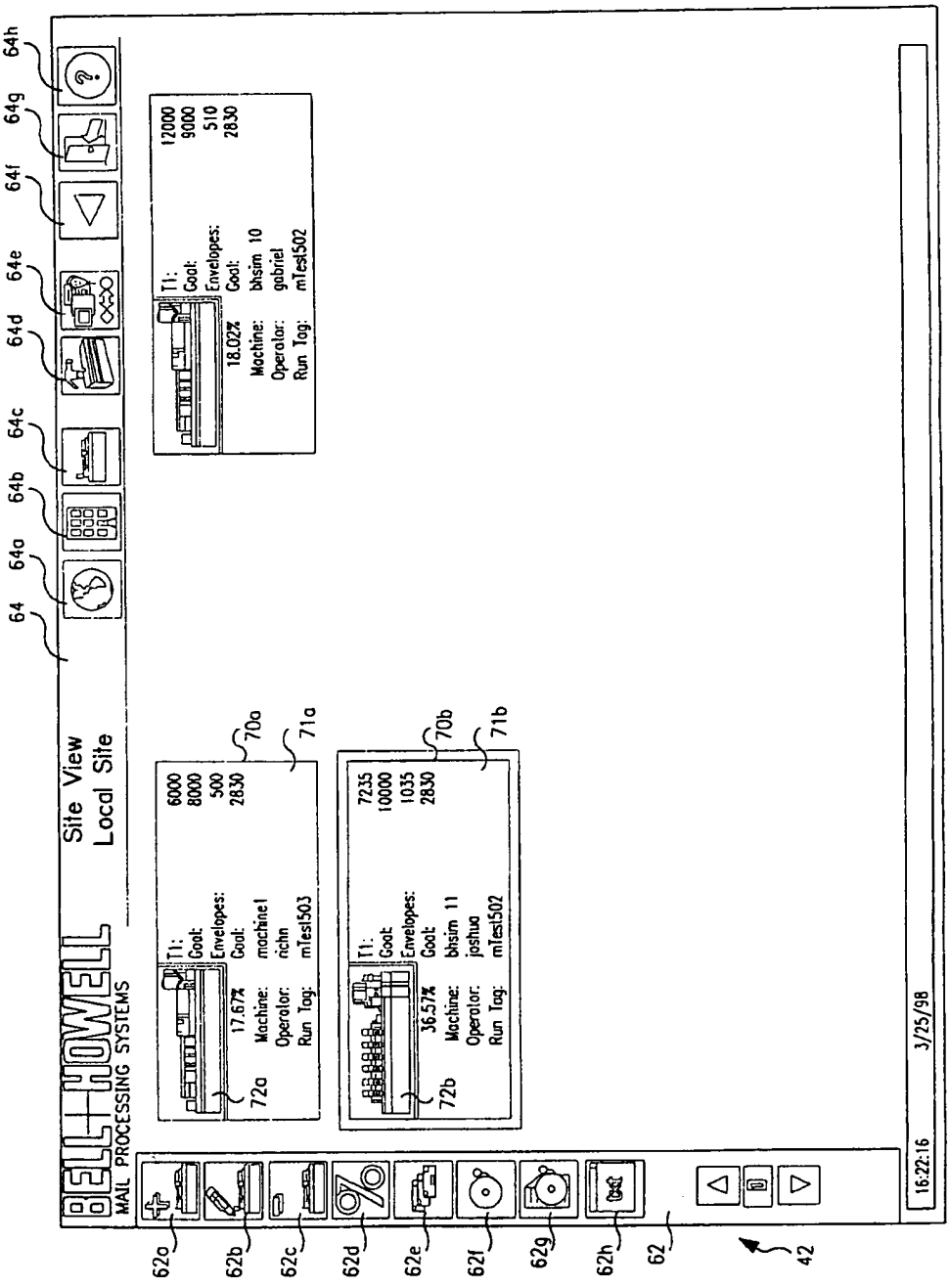
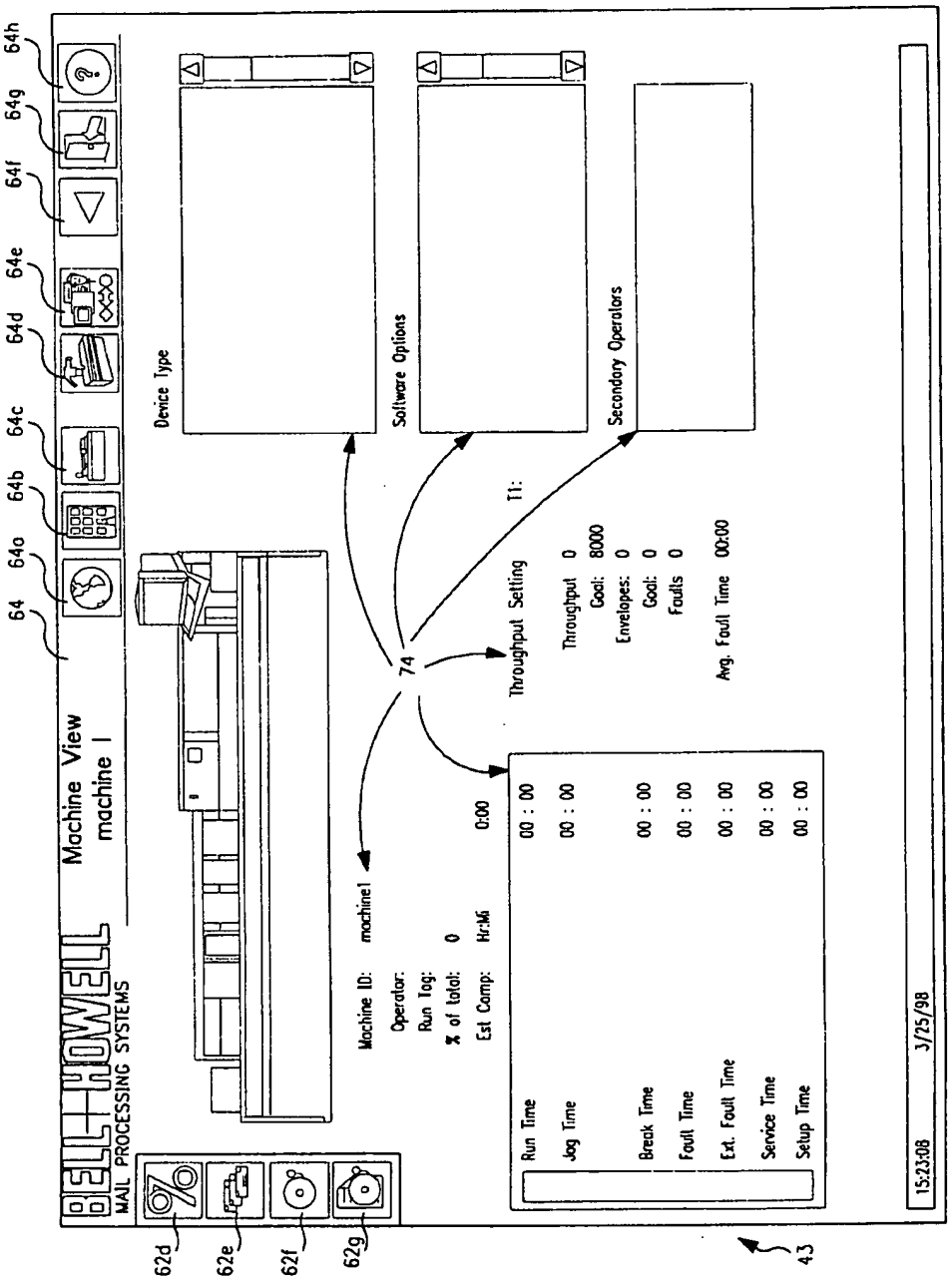

BELL+HOWELL
MAIL PROCESSING SYSTEMS
Site View
Local Site
64
64a
64b
64c
64d
64e
64f
64g
64h
T1:
Goal: 6000
Envelopes: 8000
Goal: 500
17.67%
Machine: machine1
Operator: richn
Run Tag: mTest503
2830
70a
71a
72a
T1:
Goal: 7235
Envelopes: 10000
Goal: 1035
36.57%
Machine: bhsim 11
Operator: joshua
Run Tag: mTest502
2830
70b
71b
72b
T1:
Goal: 12000
Envelopes: 9000
Goal: 510
18.02%
Machine: bhsim 10
Operator: gabriel
Run Tag: mTest502
2830
16:22:16
3/25/98
62a
62b
62c
62d
62e
62f
62g
62h
62
42

FIG. 8


64
64a
64b
64c
64d
64e
64f
64g
64h
BELL+HOWELL
MAIL PROCESSING SYSTEMS
Machine View
machine 1
Device Type
Software Options
Secondary Operators
74
Throughput Setting
Throughput 0
Goal: 8000
Envelopes: 0
Goal: 0
Faults 0
Avg. Fault Time 00:00
Machine ID: machine1
Operator:
Run Tag:
% of total: 0
Est Comp: Hr:Mi 0:00
Run Time 00 : 00
Jog Time 00 : 00
Break Time 00 : 00
Fault Time 00 : 00
Ext. Fault Time 00 : 00
Service Time 00 : 00
Setup Time 00 : 00
15:23:08
3/25/98
62d
62e
62f
62g
43

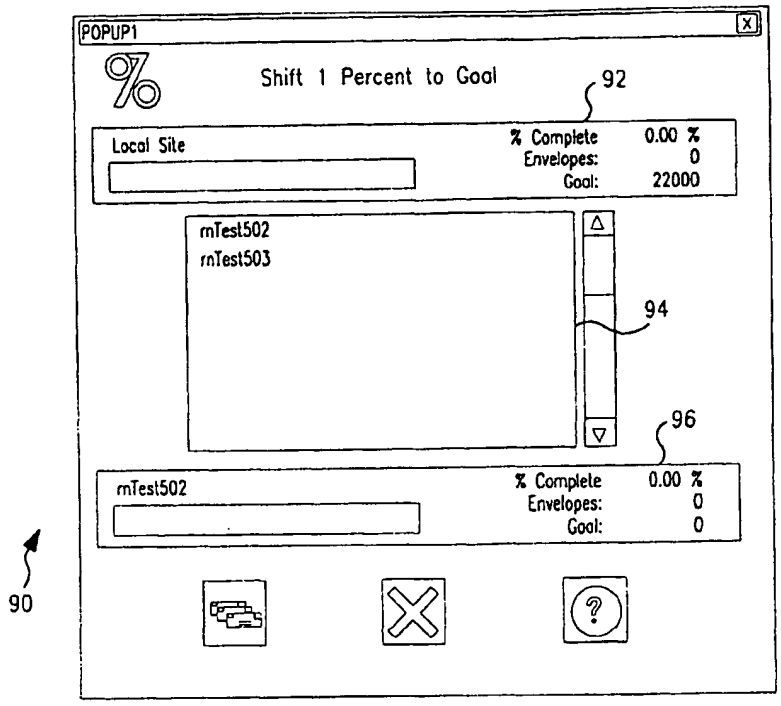

POPUP1
Shift 1 Percent to Goal
92
Local Site
% Complete 0.00 %
Envelopes: 0
Goal: 22000
rnTest502
rnTest503
94
96
rnTest502
% Complete 0.00 %
Envelopes: 0
Goal: 0
90

FIG. 9

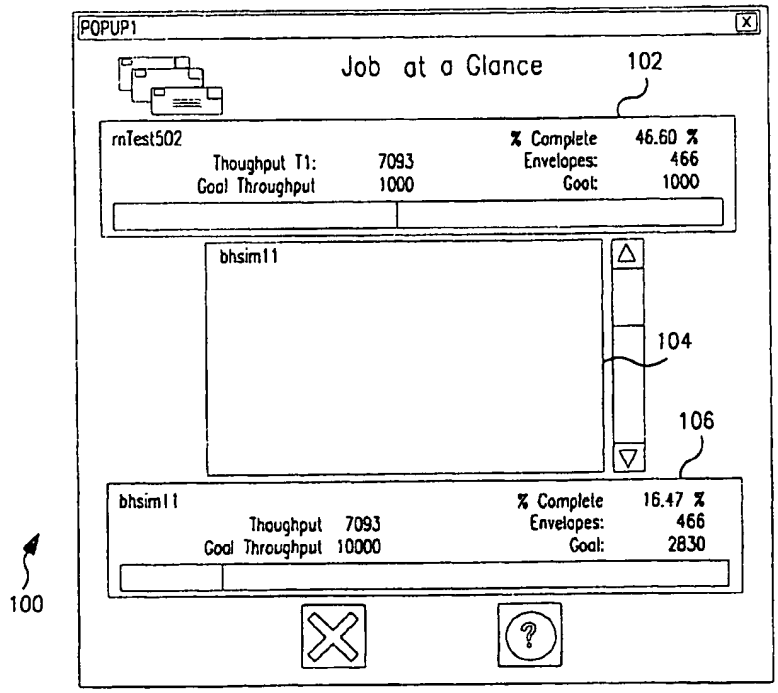

POPUP1
Job at a Glance
102
rnTest502
% Complete 46.60 %
Thoughput T1: 7093
Envelopes: 466
Goal Throughput 1000
Goal: 1000
bhsim11
104
106
bhsim11
% Complete 16.47 %
Thoughput 7093
Envelopes: 466
Goal Throughput 10000
Goal: 2830
100

FIG. 10

FIG. 11

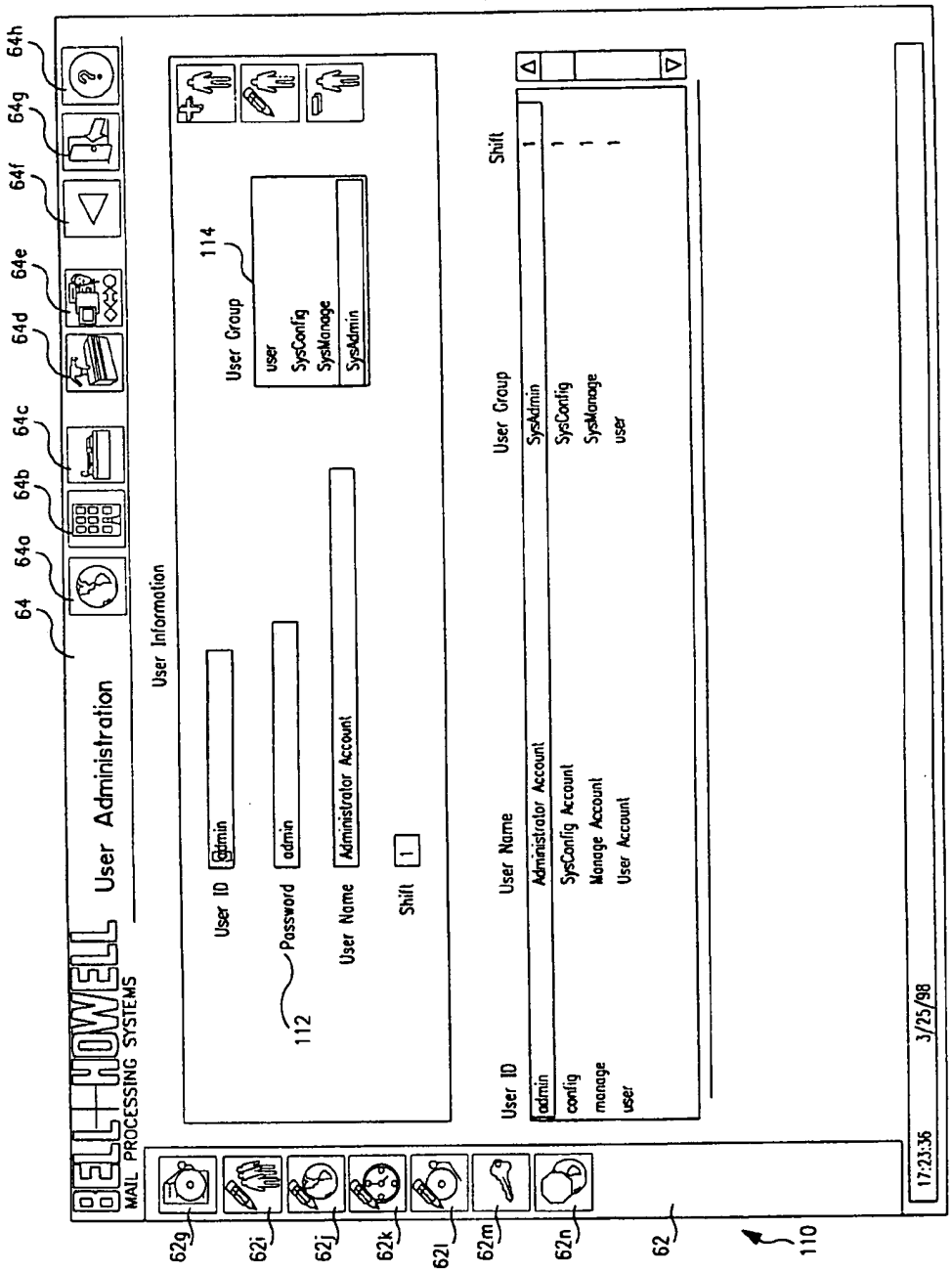

BELL+HOWELL
MAIL PROCESSING SYSTEMS
User Administration
User Information
User ID
admin
Password
admin
User Name
Administrator Account
Shift
1
User Group
user
SysConfig
SysManage
SysAdmin
114
112
User ID
User Name
User Group
Shift
admin
Administrator Account
SysAdmin
1
config
SysConfig Account
SysConfig
1
manage
Manage Account
SysManage
1
user
User Account
user
1
17:23:36
3/25/98
64
64a
64b
64c
64d
64e
64f
64g
64h
62g
62i
62j
62k
62l
62m
62n
62
110

FIG. 12

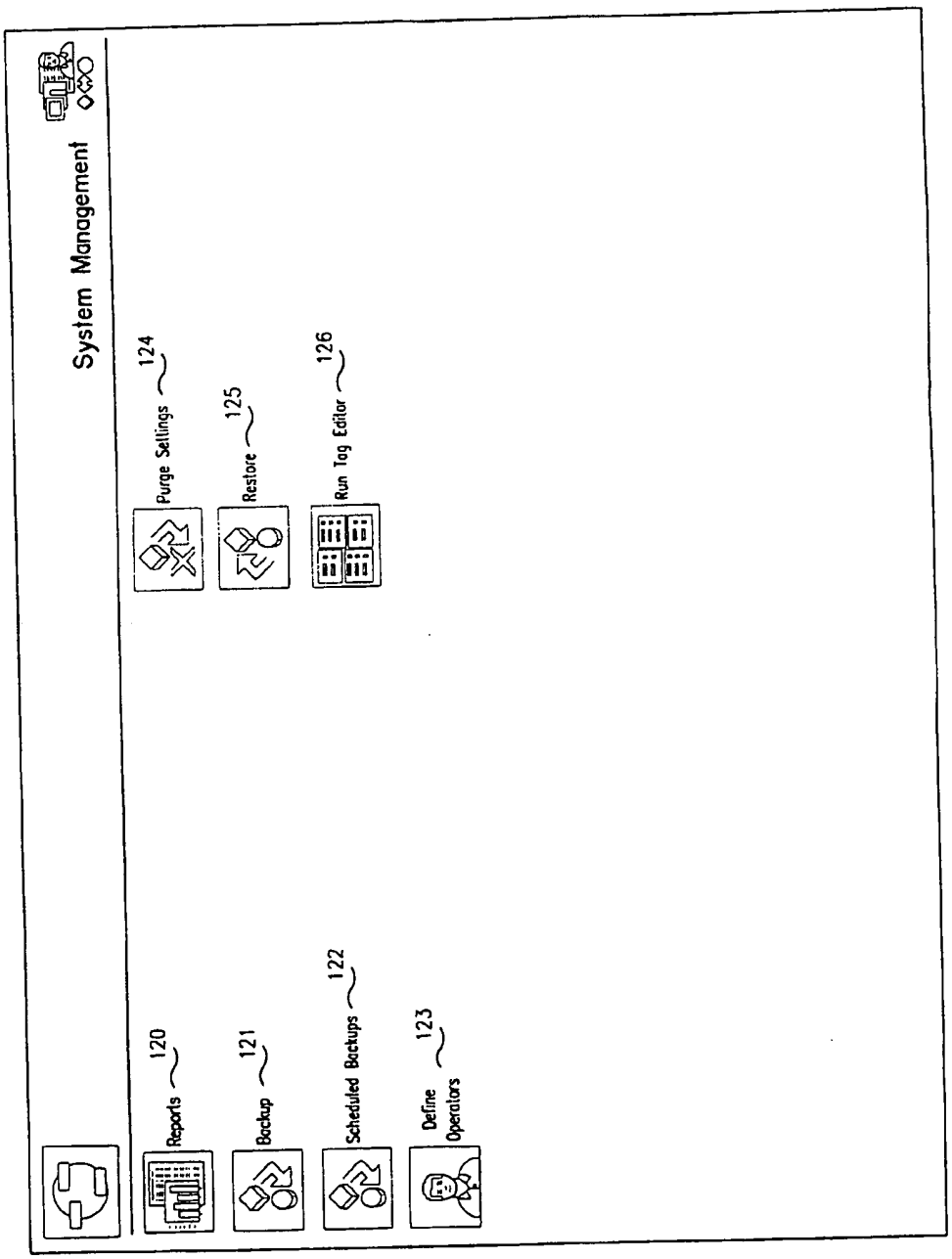

System Management
Purge Settings
124
Restore
125
Run Tag Editor
126
Reports
120
Backup
121
Scheduled Backups
122
Define Operators
123

FIG. 13

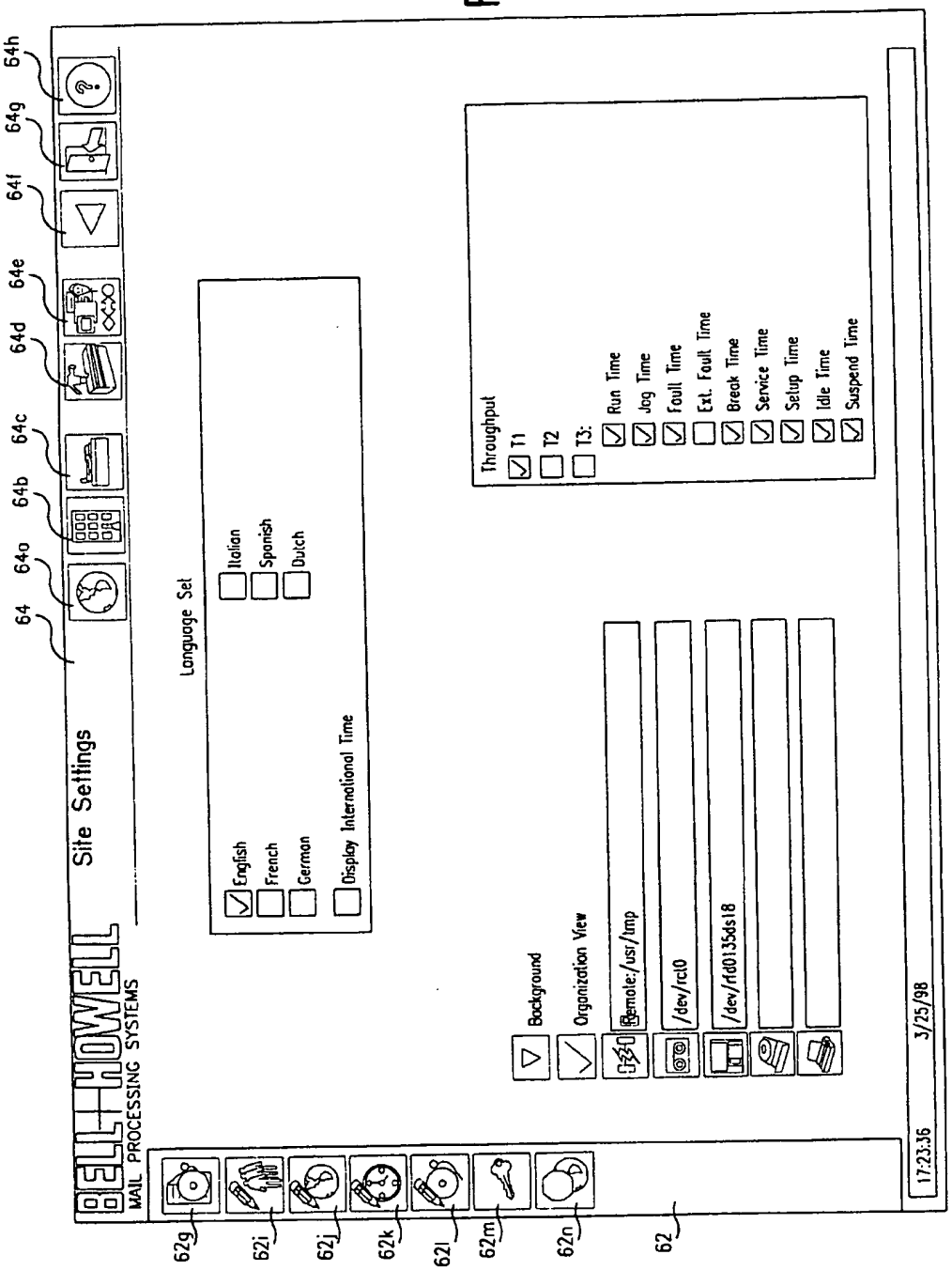

BELL+HOWELL
MAIL PROCESSING SYSTEMS
Site Settings
Language Set
English
French
German
Italian
Spanish
Dutch
Display International Time
Throughput
T1
T2
T3:
Run Time
Jog Time
Fault Time
Ext. Fault Time
Break Time
Service Time
Setup Time
Idle Time
Suspend Time
Background
Organization View
Remote:/usr/tmp
/dev/rcl0
/dev/rfd0135ds18
17:23:36
3/25/98
64
64a
64b
64c
64d
64e
64f
64g
64h
62g
62i
62j
62k
62l
62m
62n
62

FIG. 14

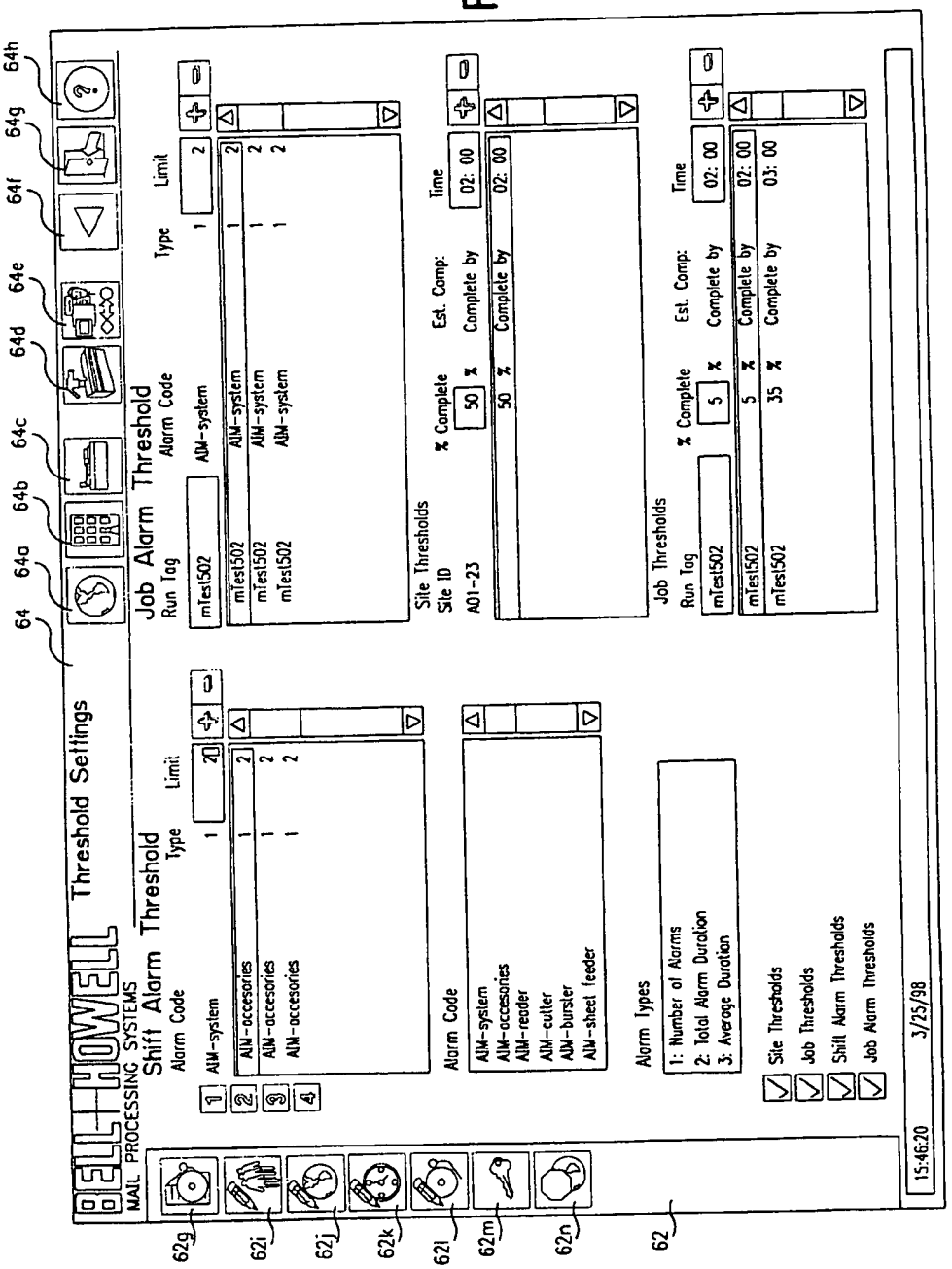

64
64a
64b
64c
64d
64e
64f
64g
64h
Threshold Settings
MAIL PROCESSING SYSTEMS
Shift Alarm Threshold
Alarm Code
Type
Limit
AIM-system
AIM-accesories
AIM-reader
AIM-cutter
AIM-burster
AIM-sheet feeder
Job Alarm Threshold
Run Tag
mTest502
Site Thresholds
Site ID
A01-23
% Complete
Est. Comp:
Complete by
Time
Job Thresholds
Alarm Types
1: Number of Alarms
2: Total Alarm Duration
3: Average Duration
Site Thresholds
Job Thresholds
Shift Alarm Thresholds
Job Alarm Thresholds
15:46:20
3/25/98
62
62g
62i
62j
62k
62l
62m
62n

FIG. 15

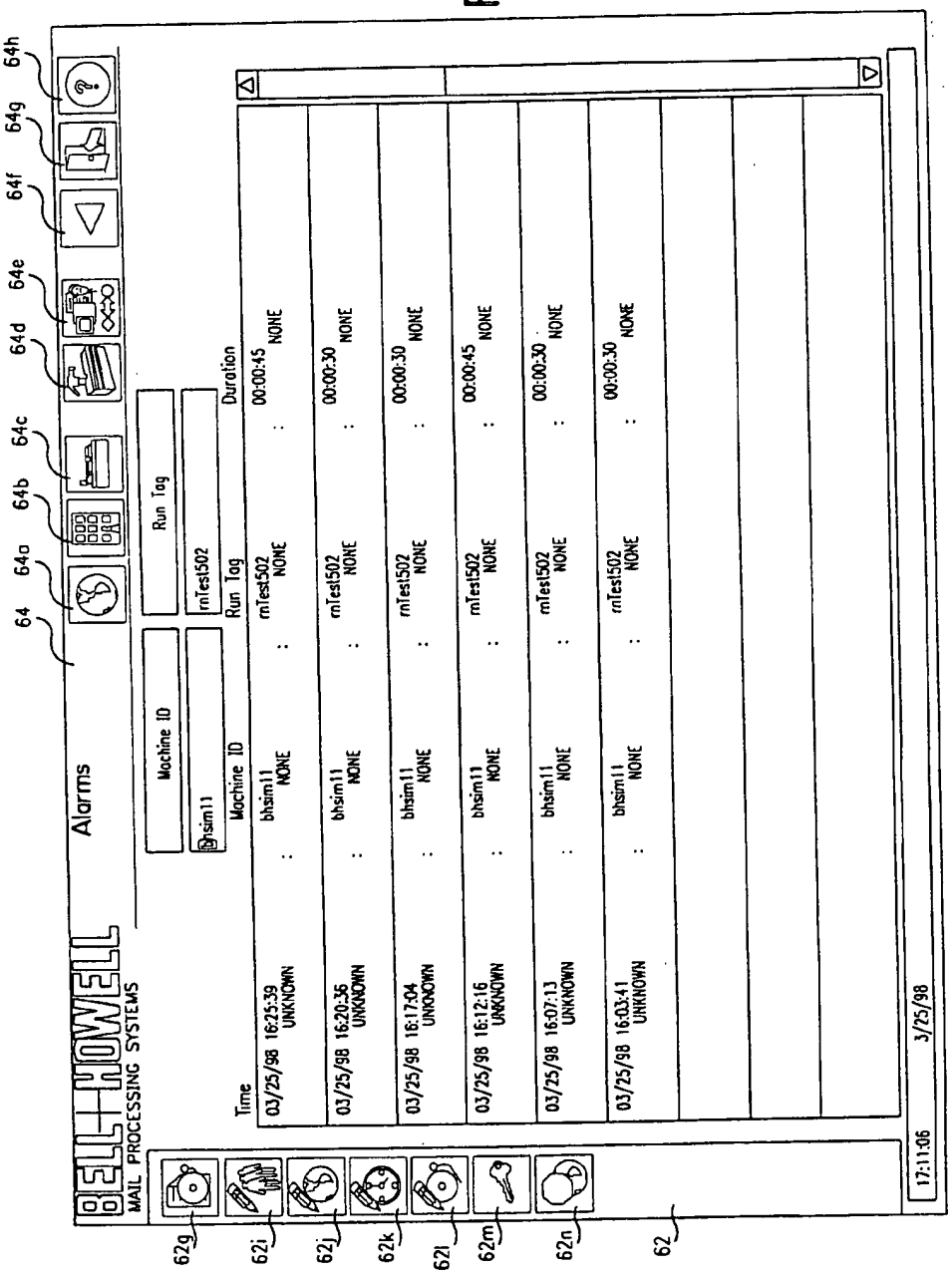

BELL+HOWELL
MAIL PROCESSING SYSTEMS
Alarms
Machine ID
bhsim11
Run Tag
rnTest502
Machine ID
Run Tag
Duration
Time
03/25/98 16:25:39 bhsim11 rnTest502 00:00:45
UNKNOWN NONE NONE
03/25/98 16:20:36 bhsim11 rnTest502 00:00:30
UNKNOWN NONE NONE
03/25/98 16:17:04 bhsim11 rnTest502 00:00:30
UNKNOWN NONE NONE
03/25/98 16:12:16 bhsim11 rnTest502 00:00:45
UNKNOWN NONE NONE
03/25/98 16:07:13 bhsim11 rnTest502 00:00:30
UNKNOWN NONE NONE
03/25/98 16:03:41 bhsim11 rnTest502 00:00:30
UNKNOWN NONE NONE
17:11:06
3/25/98
64
64a
64b
64c
64d
64e
64f
64g
64h
62g
62i
62j
62k
62l
62m
62n
62

FIG. 16

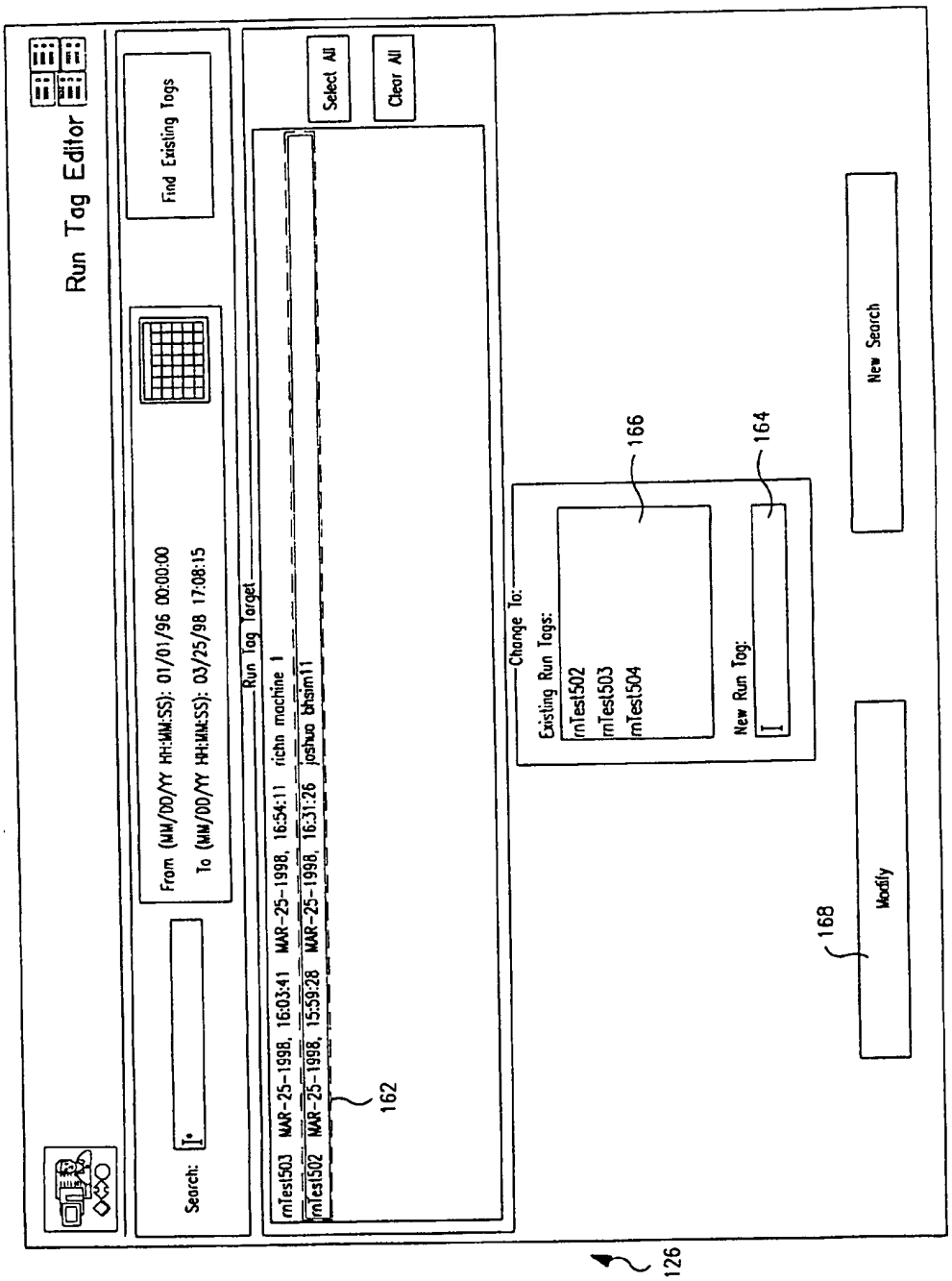

Run Tag Editor
Search:
From (MM/DD/YY HH:MM:SS): 01/01/96 00:00:00
To (MM/DD/YY HH:MM:SS): 03/25/98 17:08:15
Find Existing Tags
Run Tag Target
Select All
Clear All
mTest503 MAR-25-1998, 16:03:41 richn machine 1
mTest502 MAR-25-1998, 15:59:28 MAR-25-1998, 16:31:26 joshua bhsim11
162
Change To:
Existing Run Tags:
mTest502
mTest503
mTest504
166
New Run Tag:
164
New Search
168
Modify
126

FIG. 17

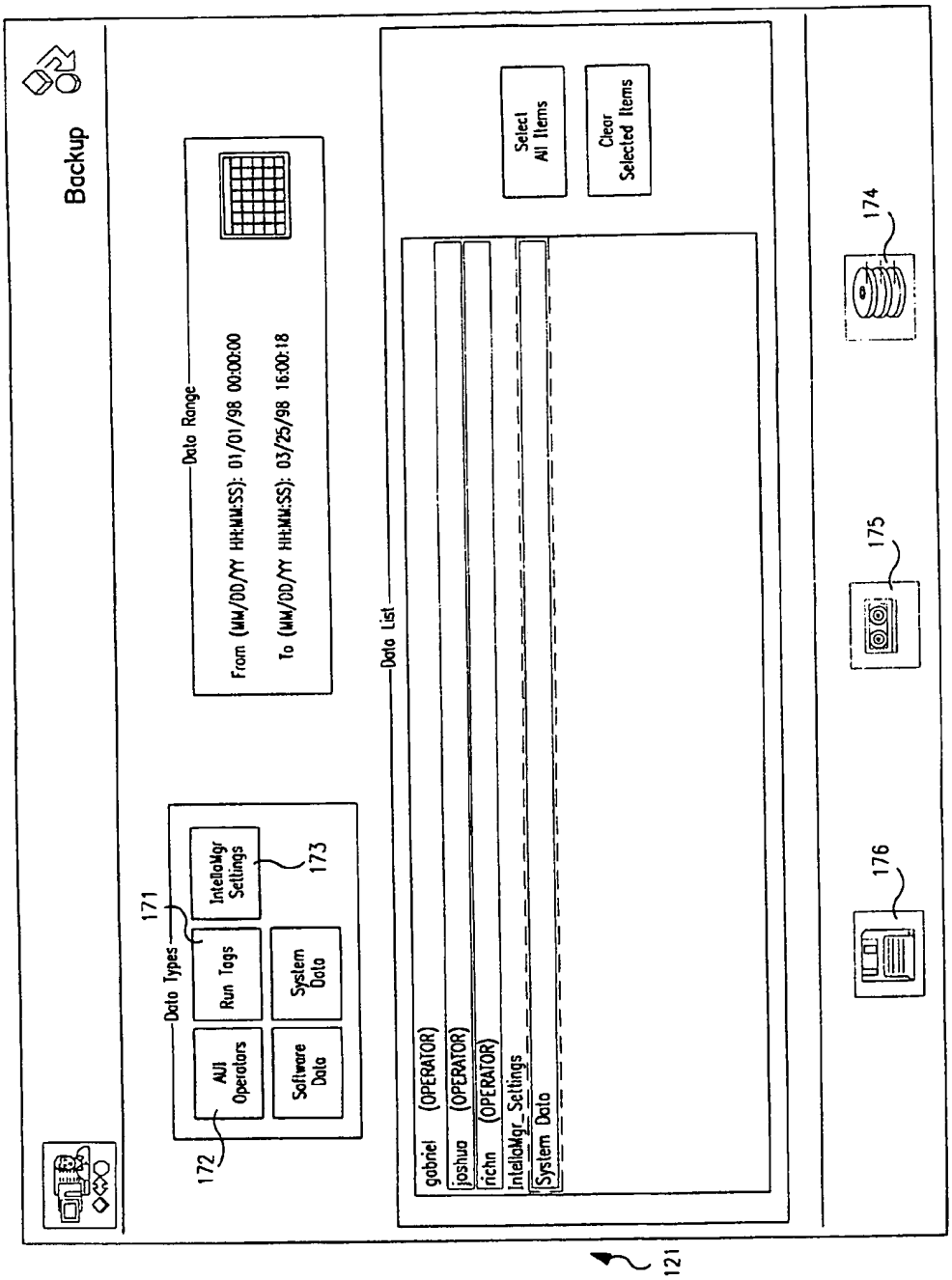

Backup
Data Range
From (MM/DD/YY HH:MM:SS): 01/01/98 00:00:00
To (MM/DD/YY HH:MM:SS): 03/25/98 16:00:18
Select All Items
Clear Selected Items
Data Types
171
All Operators
Run Tags
IntelliMgr Settings
Software Data
System Data
173
172
Data List
gabriel (OPERATOR)
joshua (OPERATOR)
richn (OPERATOR)
IntelliMgr_Settings
System Data
174
175
176
121

FIG. 18

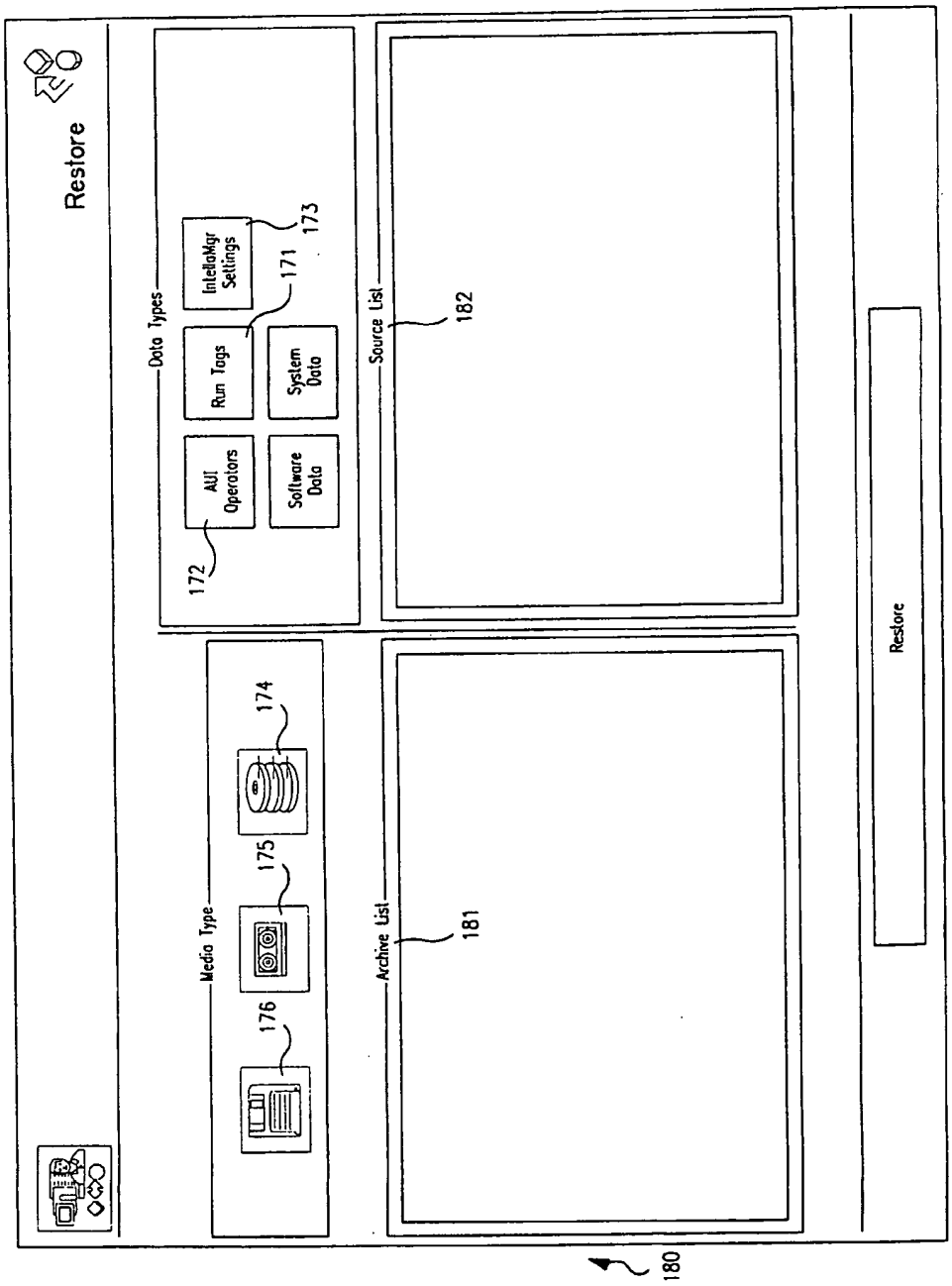
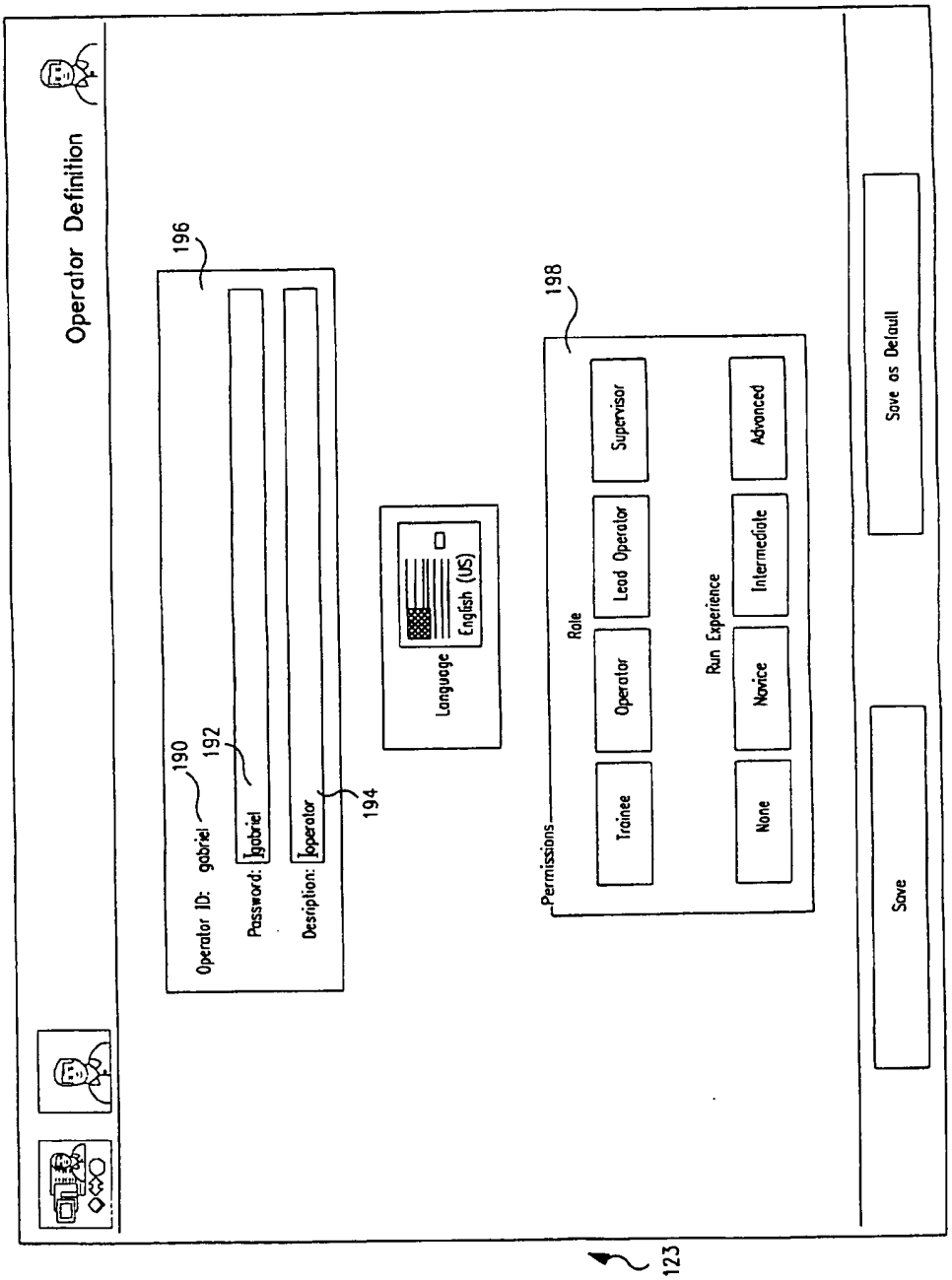

Restore
Data Types
IntelliMgr Settings
Run Tags
System Data
AUI Operators
Software Data
Source List
Media Type
Archive List
Restore
171
172
173
174
175
176
180
181
182

FIG. 19


Operator Definition
196
Operator ID: gabriel
190
192
Password: gabriel
Description: operator
194
Language
English (US)
198
Permissions
Role
Trainee
Operator
Lead Operator
Supervisor
Run Experience
None
Novice
Intermediate
Advanced
Save
Save as Default
123

SYSTEMS, METHODS AND COMPUTER PROGRAM PRODUCTS FOR MONITORING AND CONTROLLING MAIL PROCESSING DEVICES

RELATED APPLICATIONS

The present application is a Continuation-In-Part Application of, and claims the benefit under 37 C.F.R. §1.53(b) of, application Ser. No. 09/016,715 entitled "Systems, Methods and Computer Program Products for Monitoring and Controlling Mail Processing Devices", filed on Jan. 30, 1998 (pending). The present application also claims priority and benefit under 35 U.S.C. §119(e) of U.S. Provisional Patent Application Ser. No. 60/085,479 entitled "Systems and Method for Monitoring and Controlling Mail Processing Devices", filed on May 14, 1998. Both of the aforementioned patent applications are hereby incorporated herein by reference.

FIELD OF THE INVENTION

The present invention relates generally to mail processing equipment and more particularly to automated mail processing systems. Specifically, the present invention relates to remote monitoring and control of mail processing systems and the features thereof.

BACKGROUND OF THE INVENTION

Customized, high volume mail processing systems are used by financial institutions, insurance companies, public utilities, and various other businesses to prepare and mail letters and packages. Mail processing systems include mail inserting systems, sorting systems, and a range of modular attachments for increasing the productivity of large scale mail production operations. Mail insertion systems include a device known as a mail inserter, which physically "stuffs" individual envelopes with the appropriate contents. Many businesses, such as financial institutions and public utilities, often produce voluminous mailings on a routine basis. As such, mailings are often performed at various locations to reduce the load on any given location and to be closer to the destination of the mailings.

Unfortunately, monitoring and controlling remotely-located high volume mailing systems with existing control systems may be difficult. Existing control systems may not readily facilitate monitoring multiple remotely-located mailing systems from a central location. Furthermore, existing control systems may not readily facilitate monitoring various operating performance indicators of individual mail inserter devices within multiple remotely-located mailing systems.

DISCLOSURE OF THE INVENTION

It is therefore an object of the present invention to facilitate the monitoring of remotely-located high volume mailing systems from a central location.

It is another object of the present invention to facilitate the monitoring of various operating performance indicators of individual mail inserter devices within multiple remotely-located mailing systems.

Further objects of the invention will become apparent to those skilled in the art with reference to the accompanying figures and written description below.

In accordance with the present invention, systems, methods, and computer program products for managing and controlling, from a central location, a plurality of remotely situated mail processing devices are provided. Operation related information is displayed pertaining to each of said plurality of remotely situated mail processing devices such as, for instance, a mail insertion machine. Each mail insertion machine is represented on a computer visual display as an interactive icon. Visible indicia are associated with each icon for conveying, in real time, operational status information pertaining to the mail inserting machine represented by the icon.

The indicia associated with the mail insertion machine icons change appearance in response to a change in the certain operation related information received from a respective mail insertion machine. The indicia can be displayed as a color selected from a plurality of colors, wherein each color represents a respective operational condition or status of the mail insertion machine. Each interactive mail insertion machine site is displayable as an icon in a manner depicting the geographical location of each mail insertion device as it relates to a larger area, such as, for instance, the continental United States, or South America. Interactive icons may be, inter alia, added, deleted, and their location and appearance on the display can be modified.

One embodiment of the present invention describes a system for remotely managing a plurality of remote mail processing devices. The system comprises receiving means for receiving operation related information from each of the remote mail processing devices. The system also includes monitoring means for remotely monitoring operation related information from each of the remote mail processing devices operatively connected to the receiving means.

According to another aspect of the present invention, each interactive icon is responsive to user actions for displaying selective operation related information about a respective mail insertion device. Each interactive icon accepts user selections via an input device. When the user activates an interactive icon, various operational information about the mail insertion device represented by the icon is displayed. This operational information may include machine status, fault information, and various other types of information related to the operation and performance of the mail insertion device. Information about the operator of the mail insertion device may also be available.

The present invention is advantageous because users can be provided with the ability to monitor multiple mail insertion systems from a single location not necessarily proximate to the machines being monitored. Furthermore, the various stages of the insertion process can be monitored in real time. The present invention can facilitate managing automated mail processing systems to increase productivity and decrease costs associated with insertion. The present invention is also advantageous because a list of mail processing device operators can be created, modified, and sent out from a central location.

BRIEF DESCRIPTION OF THE DRAWINGS

The foregoing advantages and features of the present invention will be appreciated more fully from the following description with reference to the accompanying drawings in which:

FIG. 1 of the drawings is a schematic diagram of a system for monitoring multiple mail processing systems, in accordance with the present invention;

FIG. 2 of the drawings schematically illustrates, in block diagram form, operations for managing a plurality of mail insertion devices, according to the present invention;

FIG. 3 of the drawings schematically illustrates, in block diagram form, operations for controlling a plurality of mail insertion devices, according to the present invention;

FIG. **4** of the drawings schematically illustrates a hierarchical arrangement of computer screens for managing a plurality of mail insertion devices, according to the present invention;

FIG. **5** of the drawings illustrates a startup screen presented to the user upon startup of the present invention;

FIG. **6** of the drawings illustrates an Organizational View screen according to the present invention;

FIG. **7** of the drawings illustrates a Site View screen according to the present invention;

FIG. **8** of the drawings illustrates a Machine View screen according to the present invention;

FIG. **9** of the drawings illustrates a Percent to Goal screen according to the present invention;

FIG. **10** of the drawings illustrates a Job at a Glance screen according to the present invention;

FIG. **11** of the drawings illustrates a User Administration screen according to the present invention;

FIG. **12** of the drawings illustrates a System Management screen according to the present invention;

FIG. **13** of the drawings illustrates a pop-up screen for selecting a language for text to be displayed in;

FIG. **14** of the drawings illustrates a Threshold Setting screen according to the present invention;

FIG. **15** of the drawings illustrates a pop-up screen for Alarm Status;

FIG. **16** of the drawings illustrates a Run Tag Editor screen according to the present invention;

FIG. **17** of the drawings illustrates a Backup screen according to the present invention;

FIG. **18** of the drawings illustrates a Restore screen according to the present invention; and

FIG. **19** of the drawings illustrates an Operator Definition screen according to the present invention.

BEST MODE FOR CARRYING OUT THE INVENTION

The present invention now is described more fully hereinafter with reference to the accompanying drawings, in which preferred embodiments of the invention are shown. This invention may, however, be embodied in many different forms and should not be construed as limited to the embodiments set forth herein; rather, these embodiments are provided so that this disclosure will be thorough and complete, and will fully convey the scope of the invention to those skilled in the art.

As will be appreciated by one of skill in the art, the present invention may be embodied as a method, data processing system, or computer program product. Accordingly, the present invention may take the form of an entirely hardware embodiment, an entirely software embodiment or an embodiment combining software and hardware aspects. Furthermore, the present invention may take the form of a computer program product on a computer-readable storage medium having computer-readable program code means embodied in the medium. Any suitable computer readable medium may be utilized including hard disks, CD-ROMs, optical storage devices, or magnetic storage devices.

The present invention is described below with reference to flowchart illustrations of methods, apparatus (systems) and computer program products according to the invention. It will be understood that each block of the flowchart illustrations, and combinations of blocks in the flowchart illustrations, can be implemented by computer program instructions. These computer program instructions may be loaded onto a general purpose computer, special purpose computer, or other programmable data processing apparatus to produce a machine, such that the instructions which execute on the computer or other programmable data processing apparatus create means for implementing the functions specified in the flowchart block or blocks. These computer program instructions may also be stored in a computer-readable memory that can direct a computer or other programmable data processing apparatus to function in a particular manner, such that the instructions stored in the computer-readable memory produce an article of manufacture including instruction means which implement the function specified in the flowchart block or blocks. The computer program instructions may also be loaded onto a computer or other programmable data processing apparatus to cause a series of operational steps to be performed on the computer or other programmable apparatus to produce a computer implemented process such that the instructions which execute on the computer or other programmable apparatus provide steps for implementing the functions specified in the flowchart block or blocks.

Accordingly, blocks of the flowchart illustrations support combinations of means for performing the specified functions, combinations of steps for performing the specified functions and program instruction means for performing the specified functions. It will also be understood that each block of the flowchart illustrations, and combinations of blocks in the flowchart illustrations, can be implemented by special purpose hardware-based computer systems which perform the specified functions or steps, or combinations of special purpose hardware and computer instructions.

As will readily be appreciated by those skilled in the art, mail processing systems can encompass several types of remote and/or local mail processing machines, including, but not limited to, mail insertion machines and mail sorting machines. In a conventional mail processing system, mail inserting machines (also referred to hereinafter as insertion machines or insertion devices) are utilized for stuffing inserts into awaiting envelopes. Thereafter, the stuffed envelopes are sealed and various other operations associated with mail processing are performed. Insertion machines typically operate at high speeds and can often stuff ten thousand (10,000) envelopes or more per hour. An exemplary insertion machine is described in Applicants' issued U.S. Pat. No. 4,798,040 to Haas et al., the disclosure of which is incorporated herein by reference.

Referring now to FIG. **1**, a schematic diagram of multiple mail insertion machines monitored and controlled by computer systems, methods and computer program products, in accordance with the present invention, is illustrated. Sites A and B each have one or more mail insertion machines **10** and are monitored and controlled via the present invention operating on computer system **12**. Computer system **12** includes a display **14** for visually displaying information to a computer user, a central processing unit (CPU) and internal memory. Keyboard **16** and mouse **18** allow the user to provide input to the central processing unit. With the mouse **18**, the user may move a pointer on the display **14** to an area displaying an object. By pressing and releasing a button on the mouse **18** while the pointer is in the area displaying the object or icon, the user "activates" the icon. This is also referred to hereinafter as "clicking on" an icon. Computer system **12**, serves as data processing means for transmitting and receiving information from and to each mail insertion machine **10** and displaying same via display **14**. Other

computing systems, including mainframe computing systems, may be utilized to facilitate communicating with the various mail processing devices being monitored and controlled.

The present invention may be stored in computer system **12**, either within internal memory or on internal disk storage. The present invention may also be stored on computer readable media and used therefrom by computer system **12**. As will be described in detail below, the present invention alters the operation of computer system **12**, allowing it to monitor and control a plurality of mail insertion devices in real time.

Referring now to the block diagram of FIG. **2**, operations for managing a plurality of mail insertion devices, according to one aspect of the present invention, are illustrated. Operations include receiving operation related information from mail insertion devices (Block **20**); representing each of the mail insertion devices as an interactive icon having indicia for displaying operation related information for a respective mail insertion device (Block **22**); accepting selection of an interactive icon (Block **24**); and displaying operating status for the selected mail insertion device (Block **26**).

Operation related information includes, but is not limited to, organizational, site, machine, utility, and system administration information. Organizational information comprises site addition, deletion, and modification capability as well as instantaneous production and goal data. Site information comprises instantaneous production and goal data, job data, fault data, and alarm data with respect to a particular site. Machine information comprises instantaneous production and goal data, job data, fault data, and alarm data with respect to a particular machine. Utility information comprises alarm data, user administration data, shift data, language data, threshold setting data, and run-time manager data. System administration information comprises report data, remote machine setup data, backup and restore data, and run tag editor data.

It is to be understood that a user does not necessarily have to select an icon to view information about a particular mail insertion device. Various information relating to a mail insertion device may be automatically updated and displayed. The operations illustrated in FIG. **2** may be performed in the various "views" described in detail below using FIGS. **4–18**.

Referring now to FIG. **3**, operations for controlling a plurality of mail insertion devices, according to one aspect of the present invention, are illustrated. Operations include receiving operation related information from mail processing devices (Block **30**); and monitoring the received operation related information with respect to mail processing device performance (Block **32**).

Referring now to FIG. **4**, a hierarchical arrangement **40** of computer screens for facilitating management of a plurality of mail insertion devices, according to the present invention, is illustrated. From a main menu **40***a* presented to the user on a computer display, the user may select an "Organizational View" **41** of multiple sites having mail insertion machines, a "Site View" **42** of individual sites having mail insertion machines, a "Machine View" **43** of individual insertion machines at a particular site; a "Utilities" **44** selection comprising several options; and a "System Administration" **45** selection comprising several options.

Various screens containing operating information are available from each of the respective Organizational View **41**, Site View **42**, and Machine View **43** screens. For example, the user may access the "Percent to Goal" screen **41***a*, and the "Add" **41***b*, "Modify" **41***c*, or "Delete" **41***d* settings screens from the Organizational View screen **41**. The user may access the "Percent to Goal" screen **42***a*, the "Jobs at a Glance" screen **42***b*, the "Faults at a Glance" screen **42***c*, and the "Alarms" screen **42***d* from the Site View Screen **42**. The user may access the "Percent to Goal" screen **43***a*, the "Jobs at a Glance" screen **43***b*, the "Faults at a Glance" screen **43***c*, and the "Alarms" screen **43***d* from the Machine View Screen **43**. Each of these screens, and the information presented thereby, are described in detail below.

The user may select (i.e., run) various utility programs via screens accessible via the "Utilities" screen **44** such as the "Alarms" screen **44***a*, the "User Administration" screen **44***b*, the "Shift Setup" screen **44***c*, the "Language Setup" screen **44***d*, the "Threshold Settings" screen **44***e*, and the "Run-Time Manager" screen **44***f*. In addition, the user may perform various administrative tasks via the "Systems Administration" screen **45** such as the "Reports" screen **45***a*, the "Setup of Inserting Machine Operators" screen **45***b*, the "Backup/Restore" screen **45***c*, and the "Run-Tag Editor" screen **45***d*. Each of these screens, and the information presented thereby, are described in detail below.

Logo Screen and Log-In

The initial screen on the user's display, when the present invention is initiated on a computer, is preferably a logo or start-up screen **50** such as that illustrated in FIG. **5**. Clicking at any point on the start-up screen **50** preferably activates a login procedure via a pop-up screen. For security reasons, it is required that the user enter a user name and password in order to proceed. As would be understood by those having skill in the art, options available to a user upon login may depend on permissions assigned to the particular user.

Once properly logged in, the present invention allows users to view various operational and performance information about multiple remotely-located mail insertion machines. Users are presented with a hierarchy of views depicting organizational, site, and machine-specific perspectives of their mail insertion machines. The user can display text throughout the various screens in a variety of languages including, but not limited to, English, Spanish, French, Italian, German and Dutch. Preferably, a language can be selected via a pop-up screen such as that illustrated in FIG. **13**. Each hierarchical view will be described below in detail.

Each view screen, organizational, site and machine, also presents the user with various toolbars containing icons for performing various functions. In the embodiment of the Organizational View Screen illustrated in FIG. **6**, two toolbars **62** and **64** are presented to the user. Each toolbar contains icons for performing specific functions. Preferably, toolbars **62** and **64** are presented to the user with the same configuration in all views in order to maintain a consistent and easy to use interface. It is understood, however, that certain functions may not be executable from certain screens. In this case, the icons representing those functions are shaded or greyed out indicating they are not a valid selection or operation from the present screen.

Table 1 below describes the function of each of the icons contained within toolbar **62**.

TABLE 1

Icon #	Icon Name	Icon Function
62a	Add (Site/Machine)	Add a site or a machine.
62b	Edit (Site/Machine)	Edit a selected site or machine.
62c	Delete (Site/Machine)	Delete a selected site or machine.

TABLE 1-continued

Icon #	Icon Name	Icon Function
62d	Percent to Goal	Access the Percent to Goal panel.
62e	Job at a Glance	Access the Job at a Glance panel.
62f	Faults at a Glance	Access the Faults at a Glance panel.
62g	Alarms	Access the Alarms panel.
62h	Text	Toggle between a graphic and text display.
62i	User Administration	Access the User Administration panel.
62j	Site Settings	Access the Site Settings panel.
62k	Shift Settings	Access the Shift Settings panel.
621	Threshold Settings	Access the Threshold Settings panel.
62m	Run Manager	Access the Run Manager panel.
62n	Shut-down Application	Shut-down the current application.

Table 2 below describes the function of each of the icons contained within toolbar **64**.

TABLE 2

Icon #	Icon Name	Icon Function
64a	Organizational View	Display all sites currently configured.
64b	Site View	Display the site settings for a selected site.
64c	Machine View	Display all the machines defined at a particular site.
64d	Utilities	Display the Alarms panel. Access other Utilities.
64e	System Administration	Access various system administration tasks.
64f	Back	Return to the previous panel.
64g	Log off	Log out and return to main panel.
64h	Help	Access help panels.

It is understood that additional graphic designs may be utilized for each icon without departing from the spirit and intent of the present invention.

Organizational View

The Organizational View screen **41**, illustrated in FIG. **6**, preferably includes a geographical background on which the user can place up to twelve (12) sites having mail insertion machines in a geographically oriented arrangement. Although the illustrated embodiment depicts North America as the background, it is to be understood that any geographical depiction is possible using the present invention. Furthermore, no geographical background may be presented if so desired by the user. In the case where users do not have multiple sites, the organizational view can be deactivated and removed from the screen hierarchy.

The Organizational View screen **41** allows the user to display site icons **60** for each site having mail insertion machines. The user will be able to activate site icons **60** and be advanced to "Site View" for the respective site, as described in detail below.

The user can add, delete and modify information associated with each site by "clicking on" or otherwise activating the respective site icon **60** and then clicking on or otherwise activating the respective add, edit, or delete icons **62***a*, **62***b*, **62***c*. If the user is modifying a site, a pop-up window with the selected site's information appears on the screen for editing when icon **62***b* is activated. If the user is deleting a site, the site icon will simply disappear from the screen when icon **62***c* is activated. To add a site, the user activates icon **62***a* and a pop-up window, designed to receive input from the user, appears on the screen.

Site View

Preferably, when the user "clicks on" or otherwise activates a site icon, a Site View screen is presented to the user for the site represented by the activated icon. A Site View screen displays the location of mail insertion machines at a selected site via machine icons. An exemplary Site View screen **42** is illustrated in FIG. **7**, wherein two insertion machines are represented by machine icons **70***a* and **70***b*. Preferably a maximum of twelve (12) mail insertion machines are displayed per Site View screen **42**, not to exceed a total of one hundred (100) machines.

For each mail insertion machine at a site, the following information is preferably available via a respective machine icon: machine status, actual and goal throughput, actual and goal envelope counts, percent completion for the current run, the current operator identification, and the current job identification. Preferably, all mail insertion machine information is available and displayable in real time. It is understood that the term "real time" shall mean a minimal refresh rate of any screen of 30 seconds or less.

The operational status or condition of a particular mail insertion machine is discernable at all times by the color of indicia surrounding each machine icon. Accordingly, the user does not have to activate the machine icon to determine the operational status of a respective mail insertion machine. As illustrated in FIG. **7**, each machine icon **70***a*, **70***b* has an area of indicia **71***a*, **71***b* immediately surrounding the graphic portion **72***a*, **72***b* of each machine icon that changes colors depending on the operating conditions of the particular insertion machine. Exemplary operating conditions and their respective colors are presented in Table 3 below.

TABLE 3

Insertion Machine Operating Condition	Color Surrounding Machine Icon
Off	Background Color
Stopped	Grey
Running/Run Pending	Green
Jogging/Jog Pending	Yellow
Faulted/Insertion Machine Communications Failure	Red
Hold/Track Hold	Orange
Operator Break	Pink
Service	White

The present invention is not limited to color as a visual indication of insertion machine operational status. Operational status can be indicated by other visual schemes which change the display of an icon in response to actual machine operational condition changes. Machine status information available from Site View includes, but is not limited to, actual and goal throughput, actual and goal envelope counts, the percent complete for a current run, the current operator identification, and the current job identification number. The information that is displayed is the current information for the inserting machine and shows the progress being made on the job that is currently running on that machine.

Users in Site View can also arrange a series of machine icons to represent the physical layout of mail insertion machines. Icons can represent the type of insertion machine and indicate the type of communication protocols being utilized. The user can add, modify, and delete insertion machine icons at each site. When adding an insertion machine, the user is prompted for the following information: type of insertion machine, machine identification, machine name, and various network parameters.

Machine View

When the user double clicks or otherwise activates an interactive machine icon in the Site View screen of FIG. **7** the Machine View screen **43** of FIG. **8** is presented for the mail insertion machine represented by that machine icon. Using the Machine View screen **43**, the user is able to view

various operational information **74** including, but not limited to, the following: machine status, actual and goal throughput, actual and goal envelope counts, estimated time to completion, the currently running job identification, the current fault count, the average fault length, a bar graph of time usage, device information, software package information and operator information. In addition, the user will be able to view the current T1, T2 or T3 formula results for each machine. As is known to those with skill in the art, for Advanced User Interface (AUI) type insertion machines (manufactured by Bell & Howell Mail Processing Systems, Allentown, Pa., and Durham, N.C.), T1 is defined as a throughput calculation of "envelopes per hour" and is calculated using the following equation:

(run envelopes/(run time+fault time))*3600

T2 is defined as a calculation of "percent utilization" and is calculated using the following equation:

(total envelopes*100)/(theoretical throughput)

For both T1 and T2, the following definitions apply:

total envelopes=run envelopes+jog envelopes

theoretical throughput=(average run speed*(run time+jog time+fault time))/3600

average run speed=run machine cycles/(run time/3600)

For Inserting System Machine Connection (ISMC) insertion machines (manufactured by Bell & Howell Mail Processing Systems) T1 is defined as follows:

T1=((total envelopes−service envelopes)*3600)/(run time+fault time)

As is known by those skilled in the art, T2 is not calculated for ISMC insertion machines because the ISMC interface generally does not supply machine cycle information.

For both types of insertion machines, T3 is a user-defined formula, and can be configured in Site Settings for each site. The numerator is"run envelopes" and the denominator may be a sum of user selected time measurements. The user may select any or all of the following time measurements to be included in the denominator: run time, jog time, fault time, extended fault time, break time, service time, idle time, or suspend time. An exemplary T3 calculation is:

(run envelopes/(run time+jog time+break time))*3600

Remote Site Connectivity

The user can view other site information by going to the Organizational View of FIG. **6** and selecting another site's icon **64***b*. The other site icon must have been previously configured in order to be present on the screen. Once the user has selected a remote site icon **64***b*, the Site View, Machine View, "Percent to Goal" pop-up, "Job at a Glance" pop-up and "Faults at a Glance" pop-up will now display information from the remote site. The user is prohibited from changing setup information for the remote site. For instance, the user can not change thresholds or run tag goals for the remote site.

Other Screens and Windows

The following screens and pop-up windows are presented to the user when the user activates certain icons and/or automatically when certain events occur.

"Faults at a Glance" Pop-Up

Icons for providing fault and job information are preferably provided in both Machine View and Site View. The user can select this pop-up window (not shown) by clicking on the "Faults at a Glance" button **62***f* on the left side of the Site View screen of FIG. **7** or the Machine View screen of FIG. **8**.

"Percent to Goal" Pop-Up

A Percent to Goal pop-up window **90**, illustrated in FIG. **9**, appears when the user clicks on the "%" icon **62***d* in either Machine View of FIG. **8** or Site View of FIG. **7**. The Percent to Goal pop-up permits the user to view current statistics. The top portion **92** displays all information pertaining to an entire site. Statistics for jobs currently running or completed during the current shift on the insertion machines at the site may be included in the top portion **92**. A list **94** of jobs allows the user to select a job and view a summary of the selected job in the bottom portion **96** of the window **90**.

"Job at a Glance" Pop-Up

A Job at a Glance pop-up window **100**, illustrated in FIG. **10**, appears when the user clicks on the "Job at a Glance" button **62***e* on the side of various screens. The top section **102** shows a summary of all elements of a job. The list **104** in the center portion of the window **100** contains all insertion machines running that particular job. When the user selects one of those insertion machines, details about the selected insertion machine will appear in the bottom section **106**. Preferred information displayed in the bottom section **106** includes, but is not limited to: machine identification, operators running machine(s), current throughput, goal throughput, current accounts completed, and total accounts in job.

User Administration

The User Administration utility screen **110**, illustrated in FIG. **11**, allows the user to add, edit, and delete users, including changing the security group of which the user is a member. In the illustrated embodiment, the top left portion **112** of the screen **110** is used to configure a user's account. In the illustrated embodiment, the top right portion **114** of the screen **110** is used to configure security groups of users. Each security group preferably has a name and a set of designated privileges. The types of privileges include: status view, operator view, reports, alarm view, file transfer, edit configuration, job programming, maintain system, and edit users.

System Management and Utilities

FIG. **12** illustrates the"System Management" screen in which the user is provided with various system management tools including report generation **120**, data backup **121**, scheduled data backup **122**, operator setup **123**, purge settings **124**, data restore **125**, and run tag editor **126**. Various utilities may also be provided for performing a variety of functions including configuring user accounts, changing the display language, and configuring shift setups. The user can view individual occurrences of alarms from the mail insertion machines as well as set alarm thresholds for specific jobs. Alarm messages preferably can be filtered either by job identification, insertion machine identification or both.

Thresholds are a significant feature of the present invention. Thresholds allow the user to pro-actively monitor the progress of inserting machines and take corrective actions if necessary. There are two different types of thresholds. The first type is alarm thresholds. Alarm thresholds (FIG. **14**) are based on occurrences of errors within a particular inserting machine. The second type is production thresholds. Production thresholds are based on the progress of completed envelopes compared to the expected goal of completed envelopes for a particular job.

Alarm Thresholds

The user may set either Shift or Run tag thresholds (FIG. **15**) of three (3) different types: number of alarm occurrences, total duration of the alarms, or average duration of the alarms. The user may select to apply the threshold to a group of alarms for a shift or for a specific run tag. When an inserting machine crosses the threshold, the user is alerted with a pop-up which displays the violated threshold.

Example:

For Shift **1**, a threshold is set for five occurrences of"AIM—reader" errors. If an inserting machine exhibits five of these errors, the user is alerted via an alert pop-up. Once the alert pop-up is dismissed, the count is re-initialized to zero and the threshold monitoring is resumed.

In addition, a pop-up window is presented to the user for viewing occurrences of thresholds on groups of errors. Table 4 below illustrates some of the errors that may be monitored and logged.

TABLE 4

General Error Type	Specific Error Type
Aim	System
Aim	Accessories
Aim	Reader
Aim	Cutter
Aim	Burster
Aim	Sheet Feeder
Aim	Turnover/Sequencer
Aim	Hold Module
Aim	Right Angle Turn
Aim	Accumulator
Aim	Diverter
Aim	Folder
Aim	Collector
Aim	Interface
Aim	Slitter
Aim	Other
Aim	All
Insert Feeder	System
Insert Feeder	Reader
Insert Feeder	Miss
Insert Feeder	Double
Insert Feeder	Other
Insert Feeder	All
Envelope Feeder	System
Envelope Feeder	Reader
Envelope Feeder	Miss
Envelope Feeder	Double
Envelope Feeder	Other
Envelope Feeder	All
Base Machine	—
Finishing	Turnover
Finishing	Sealer
Finishing	Bridge
Finishing	Other
Finishing	All
Delivery	Modular Delivery
Delivery	Postage Meter
Delivery	Printer
Delivery	Output Device
Delivery	Other
Delivery	All

Preferably, a pop-up window automatically appears on the user's display when a threshold is crossed, in order to alert the user to the particular condition. Information that is preferably displayed in such a window includes: identification of insertion machine having an error, error type, number of occurrences of error, total errors, total time lost, and average reset time. Preferably, the item that caused the threshold to trigger the pop-up window will be highlighted. For example, if a threshold was set for an average reset time of two (2) minutes and the average reset time calculated equals three (3) minutes, the "Threshold Violation" pop-up window would appear on the user's display with the average reset time of three (3) minutes highlighted. If the user needs to see specific error occurrences, he/she can go to an Alarm Browser and filter the errors by machine identification or job identification.

It is understood that additional alarm thresholds may be utilized without departing from the spirit and intent of the present invention.

Production Thresholds

The user may set either Site or Run tag thresholds for production levels. The user selects a "percentage to be complete" and a time of day at which to check the threshold. When that time of day is reached, the system checks the threshold percentage against the actual percentage to see if the production threshold is met. If the actual production percentage is greater than or equal to the threshold percentage, the threshold is met. Otherwise, the production threshold is violated and an alert pop-up is displayed.

Example:

For a run tag of "job 17A", the machines should be 50% complete by 11:30 AM. At 11:30 AM the system checks to see if the machines are 50% to the goal. If the actual percentage is less than 50%, an alert pop-up is displayed.

In addition, a pop-up window is presented to the user for viewing occurrences of production threshold violations. Preferably, a pop-up window automatically appears on the user's display when a threshold is crossed, in order to alert the user to the particular condition. Information that is preferably displayed in such a window includes: identification of insertion machine having an error, error type, number of occurrences of error, total errors, total time lost, and average reset time. Preferably, the item that caused the threshold to trigger the pop-up window will be highlighted. For example, if a threshold was set for 50% job completion by 12:00 noon and only 45% was actually achieved at that time then a production threshold violation pop-up window would appear on the user's display showing the current percentage complete thereby giving the operator an indication of job performance.

It is understood that additional production thresholds may be utilized without departing from the spirit and intent of the present invention.

Run Tag Editor

The"Run Tag Editor" screen of FIG. **16** is accessed via the"System Management" screen of FIG. **12**. The Run Tag Editor is a utility that allows the user to correct any run tag assignment mistakes made by the inserting machine operator. Since data is labeled in the present invention by a run tag, it is important that the run tag be correct. Therefore, it is desirable for the user to be able to make corrections to run tags.

Within the Run Tag Editor screen **126**, the user may search all of the run tags **162** in the database. The list includes run tags that have completed at least one run in the database. The user is prohibited from editing run tags for inserter runs that are in progress. Once the user has received the results of the run tag search, he may select one, many, or all run tags to edit. Upon selection, he will create a new run tag for the selected items either by typing a new tag **164** in the box provided on the screen or by selecting a previously used run tag from the list **166** above the box. He can then modify the tags by clicking the Modify button **168** located near the bottom of the screen. A pop-up will be presented to the user to show that the database will be altered and the user

must confirm this. Then, after the database is altered, the search list will be updated. Any errors that occur during this process will be displayed on the screen.

Backup/Restore

The data backup and restore functionality is divided into three (3) separate screens and each is accessed via the "System Management" screen of FIG. **12**. Such screens include the Backup screen (FIG. **17**), the Restore screen **180** (FIG. **18**), and the Scheduled Backup screen (not shown).

The user may choose to backup (FIG. **17**) one, many, or all of the following data types: run tag information **171**, operator setup information **172**, or system configuration information **173**. The user selects the data to be saved, selects the media (hard disk **174**, tape **175** or floppy **176**) and then executes the backup. Any errors that occur will be displayed on the screen.

The user may choose the Restore screen **180** illustrated illustrated in FIG. **18** to restore any data type from a backup file. First, the user selects the restoration media (hard disk **174**, tape **175** or floppy **176**). The selected media is accessed in order to present an archive list **181** or source list **182** of restorable data to the user. The user can then select to restore one, many, or all of the data in the backup file. Any errors that occur will be displayed on the screen for the user.

The user will be able to choose to schedule a backup for future or repeated execution. The user will select the data types and the media just as he would for a regular backup. The user would then select the time and interval at which the backup will occur. After making these selections, the user will be able to schedule the backup. The backup would then execute at the appropriate time. The user will also be able to use this screen to remove a command for a scheduled backup. The list at the top of the screen will display all currently scheduled backup parameters and the user would select any of them for viewing or deletion. Any errors that would occur during the setting of backup parameters will be displayed to the user. Any errors that would occur during a scheduled backup will be written to a log file.

A user can also define the valid list of operators for a given mail processing machine at a remote location. FIG. **19** illustrates the "Operator Definition" screen **123** selectable from the System Management screen of FIG. **12**. The Operator Definition screen **123** allows a system level user to identify operators of particular mail processing machines and define the level of access and/or control the operator will have with respect to the mail processing machine. The user will enter a unique Operator ID **190**, password **192**, and optional description **194** in the dialog box **196** on the upper portion of the screen. Next, the user will choose and assign the authority levels for this operator using the dialog box **198** in the lower center portion of the screen. This information is then communicated from the central location over a computer network to the specific mail processing machine in question. This information can be stored such that it can not be edited from the remote mail processing machine.

Hardware and Software Requirements

The present invention can be implemented in a variety of communications environments including a Local Area Network (LAN) and Wide Area Network (WAN) environments. The present invention can be implemented in communications environments utilizing TCP/IP communications protocol, such as the Internet, and environments utilizing SNA protocol. Hardware for implementing the present invention is generally consistent with typical personal computing equipment, and does not generally require special environmental conditions other than a typical office environment. Preferably, the present invention is implemented on an International Business Machines (IBM®) or IBM®-compatible personal computer and software capable of supporting a thin wire Ethernet TCP/IP environment. Even more preferable is a server based on an Intel® 486 or Pentium® processor and having at least sixteen (16) megabytes of memory to perform all functions efficiently, and having data storage capacity of at least four (4) gigabytes. Also preferred is a printer suitable for text and color graphical report printing; automatic back-up capability for data and configuration files; and trackball or mouse support. The present invention may be implemented via other computing devices, including, but not limited to, mainframe computing systems and mini-computers. It is preferable to use a high resolution color display; however, a standard personal computer monitor may be used.

The present invention may be written in various computer languages including, but not limited to, C++, Smalltalk, Java, and other conventional programming languages such as BASIC, FORTRAN and COBOL.

The present invention runs on current standard desktop computer platforms such as, but not limited to, Windows®, Windows 95®, Windows NT®, UNIX®, and OS/2®. The present invention utilizes, in part, many standard features of current desktop configurations, such as the ability to store data locally, connect to the Internet, and display visual information.

Computer readable program code means is provided for receiving processing system operation related information from each of a plurality of mail insertion devices, and for representing each of the mail insertion devices as an interactive icon on a display connected to a data processing system. Each interactive icon has indicia associated therewith which displays the operation related information for a respective mail insertion device and changes appearance in response to a change in the operation related information. Computer readable program code means is provided for displaying selective operation related information about a respective mail insertion device in response to user actions, and for displaying operation related information for each mail insertion device in real time. Computer readable program code means is provided for selecting an interactive icon via an input device operatively connected to the data processing system, and for displaying operating status for the mail insertion device represented by the selected icon.

Computer readable program code means is provided for displaying the indicia surrounding an icon as a color selected from a plurality of colors, wherein each color represents an operational condition of a mail insertion device. Computer readable program code means is provided for displaying interactive icons in a manner depicting geographical locations of respective mail insertion devices. Computer readable program code means is also provided for adding, deleting, and modifying the location and appearance of the interactive icons.

The present invention is not limited in scope to systems, methods and computer program products for monitoring and controlling mail insertion machines. The present invention may be utilized for monitoring and controlling various mail processing systems including mail sorters, printers and other equipment related thereto. The foregoing is illustrative of the present invention and is not to be construed as limiting thereof. Although a few exemplary embodiments of this invention have been described, those skilled in the art will readily appreciate that many modifications are possible in the exemplary embodiments without materially departing from the novel teachings and advantages of this invention. Accordingly, all such modifications are intended to be included within the scope of this invention as defined in the claims.

In the claims, means-plus-function clauses are intended to cover the structures described herein as performing the recited function and not only structural equivalents but also equivalent structures. Therefore, it is to be understood that the foregoing is illustrative of the present invention and is not to be construed as limited to the specific embodiments disclosed, and that modifications to the disclosed embodiments, as well as other embodiments, are intended to be included within the scope of the appended claims. The invention is defined by the following claims, with equivalents of the claims to be included therein.

That which is claimed:

1. A system for remote real-time monitoring of at least one mail inserter machine comprising:

(a) receiving means located remotely from said mail inserter machine for receiving operation related information from said mail inserter machine;

(b) monitoring means operatively connected to said receiving means for monitoring the operation related information received from said mail inserter machine and updating display of the operation related information in real time; and

(c) transmission means for sending data to said mail inserter machine.

2. The system of claim **1** wherein said receiving means and monitoring means are centrally located not necessarily proximate to said mail inserter machine.

3. The system of claim **1** wherein said receiving and monitoring means are coupled to a networked communications system for exchanging data with said mail inserter machine.

4. The system of claim **1** wherein said monitoring means updates display of the operation related information on a computer display screen at a rate of at least about one update per thirty seconds.

5. The system of claim **1** wherein said receiving means receives operation related information from a plurality of mail inserter machines located at a plurality of geographically separated sites.

6. The system of claim **1** wherein the operation related information includes mail inserter machine organizational information, site information, machine information, utility information, and system administration information.

7. The system of claim **6** wherein the mail inserter machine organizational information includes mail inserter machine site addition information, mail inserter machine site deletion information, and mail inserter machine site edit information, and mail inserter machine site job goal information.

8. The system of claim **6** wherein the mail inserter machine site information includes production information, goal information, job information, fault information, and alarm information with respect to a specified mail inserter machine site.

9. The system of claim **6** wherein the mail inserter machine machine information includes production information, goal information, job information, fault information, and alarm information with respect to said mail inserter machine.

10. The system of claim **6** wherein the mail inserter machine utility information includes alarm information, user administration information, shift information, language information, threshold setting information, and run-time manager information with respect to said mail inserter machine.

11. The system of claim **6** wherein the mail inserter machine system administration information includes report information, machine setup information, backup and restore information, and run tag editor information with respect to said mail inserter machine.

12. A method for real-time monitoring of at least one mail inserter machine comprising:

(a) receiving operation related information from a mail inserter machine from a location remote from said mail inserter machine;

(b) monitoring the operation related information received from said mail inserter machine, and updating display of the operation related information in real time; and

(c) transmitting data to said mail inserter machine.

13. The method of claim **12** wherein said receiving means and monitoring means are centrally located not necessarily proximate to any of said mail inserter machine.

14. The method of claim **12** wherein said receiving and monitoring means are coupled to a networked communications system for exchanging data with said mail inserter machine.

15. The method of claim **12** wherein receiving the operation related information includes receiving the operation related information from a plurality of mail inserter machines located at a plurality of geographically separated sites.

16. The method of claim **12** wherein updating display of the operation related information in real time includes updating display of the operation related information at a rate of at least about one update per thirty seconds.

17. The method of claim **12** wherein the operation related information includes mail inserter machine organizational information, site information, machine information, utility information, and system administration information.

18. The method of claim **17** wherein the mail inserter machine machine information includes production information, goal information, job information, fault information, and alarm information with respect to said mail inserter machine.

19. The method of claim **17** wherein the mail inserter machine utility information includes alarm information, user administration information, shift information, language information, threshold setting information, and run-time manager information with respect to said mail inserter machine.

20. The method of claim **17** wherein the mail inserter machine system administration information includes report information, machine setup information, backup and restore information, and run tag editor information with respect to said mail inserter machine.

21. The method of claim **17** wherein the mail inserter machine organizational information includes mail inserter machine site addition information, mail inserter machine site deletion information, mail inserter machine device site edit information, and mail inserter machine site job goal information.

22. The method of claim **17** wherein the mail inserter machine site information includes production information, goal information, job information, fault information, and alarm information with respect to a specified mail inserter machine site.

23. A remote real-time monitoring device for remotely monitoring at least one mail inserter machine, said remote real-time monitoring device comprising:

(a) operating parameter monitoring means located remotely from said at least one mail inserter machine for remotely monitoring the operating parameters of said at least one mail inserter machine and for updating display of the operating parameters in real time; and

(b) computer network communications means coupled to the operating parameter monitoring means for transferring data between the remote real-time monitoring device and said at least one mail inserter machine.

24. The device of claim **23** further comprising operator setup means for remotely creating, maintaining, and communicating a list of valid mail inserter machine operators for said at least one mail inserter machine.

25. The device of claim **23** further comprising run-tag editing means for remotely accessing, editing, and re-saving stored run-tag data for a specified job on said at least one mail inserter machine.

26. The device of claim **25** wherein said run-tag editing means is capable of searching and selecting individual and multiple run-tags from a stored run-tag database.

27. The device of claim **23** further comprising alarm threshold setting means for setting alarm threshold levels of tolerable error counts for specified types of errors for a specified job on said at least one mail inserter machine.

28. The device of claim **27** wherein said specified types of errors include aim errors, insert feeder errors, envelope feeder errors, finishing errors, and delivery errors.

29. The device of claim **27** further comprising production threshold setting means for setting production threshold levels of output goals to be completed within or by a specified time for a specified job on said at least one mail inserter machine.

30. The device of claim **29** wherein said output goals represent the number of envelopes processed at a specified time.

31. The device of claim **29** wherein said operating parameter monitoring means monitors the production threshold levels and alarm threshold levels of said at least one mail inserter machine in real-time and outputs a message when said threshold levels have been violated.

32. A computer program product comprising computer-executable instructions embodied in a computer-readable medium for performing steps comprising:

(a) receiving operation related information from at least one mail inserter machine from a location remote from said at least one mail inserter machine; and

(b) updating display of the operation related information received from said mail inserter machine in real time.

33. The computer program product of claim **32** wherein receiving the operation related information includes receiving the operation related information over a TCP/IP network.

34. The computer program product of claim **32** comprising sending data to said mail inserter machine.

35. The computer program product of claim **32** wherein receiving the operation related information includes receiving the operation related information from a plurality of mail inserter machines located at geographically separated sites.

36. The computer program product of claim **32** wherein updating display of the operation related information in real time includes updating display of the operation related information at a rate of at least about one update per thirty seconds.

37. A system for remote real-time monitoring of at least one mail sorting machine, said system comprising:

(a) receiving means for receiving operation related information from said mail sorting machine from a location remote from said at least one mail sorting machine; and

(b) monitoring means operatively connected to said receiving means for monitoring the operation related information received from said mail sorting machine and updating display of the operation related information in real time.

38. The system of claim **37** comprising transmission means for sending data to said mail sorting machine.

39. The system of claim **38** wherein said receiving means receives operation related information from a plurality of mail sorting machines located at a plurality of sites geographically separated from each other.

40. The system of claim **37** wherein said monitoring means updates display of the operation related information on a computer display screen at a rate of at least about one update per thirty seconds.

41. A method for remote real-time monitoring of at least one mail sorting machine comprising:

(a) receiving operation related information from a mail sorting machine from a location remote from said mail sorting machine; and

(b) updating display of the operation related information in real time.

42. The method of claim **41** comprising transmitting data to said mail sorting machine.

43. The method of claim **41** wherein receiving the operation related information includes receiving the operation related information from a plurality of mail sorting machines located at geographically separate sites.

44. The method of claim **41** wherein updating display of the operation related information in real time includes updating display of the operation related information at a rate of at least about one update per thirty seconds.

45. A computer program product comprising computer-executable instructions embodied in a computer-readable medium for performing steps comprising:

(a) receiving, from a user, a threshold percentage value relating to percentage completion of a job by at least one mail processing machine and a time value for checking whether the mail processing machine has reached the percentage;

(b) receiving at least one measured percentage value indicating the percentage completion of a job by the mail processing machine from a location remote from the mail processing machine;

(c) when the time value is reached, determining whether the measured percentage value equals the threshold percentage value; and

(d) if the measured percentage value is less than the threshold percentage value, displaying an alarm to the user.

46. The computer program product of claim **45** wherein receiving at least one measured percentage value includes receiving at least one measured percentage value from one or more mail inserter machines.

47. The computer program product of claim **45** wherein receiving at least one measured percentage value includes receiving at least one measured percentage value from one or more mail sorting machines.

48. The computer program product of claim **45** wherein alerting the user includes displaying a pop-up window to the user.

49. The computer program product of claim **48** wherein the pop-up window displays the measured percentage value.

50. The computer program product of claim **45** comprising updating display of the measured percentage value in real time.

51. The computer program product of claim **50** wherein updating display of the measured percentage value includes updating display at a rate of at least about one update per thirty seconds.

52. A run tag editor comprising computer-executable instructions embodied in a computer-readable medium for performing steps comprising:

(a) searching a database for run tags indicative of jobs performed by at least one mail processing machine;

(b) displaying run tags extracted from the database to a user;

(c) receiving input from a user allowing modification of the displayed run tags and addition of new run tags; and

(d) storing the modified or new run tags in the database.

53. The computer program product of claim **52** wherein run tags are indicative of jobs performed by a mail inserter machine.

54. The computer program product of claim **52** wherein the run tags are indicative of jobs performed by a mail sorting machine.

* * * * *

L Number	Hits	Search Text	DB	Time stamp
1	2	5224046.pn.	USPAT; US-PGPUB; EPO; JPO; DERWENT; IBM_TDB	2003/05/05 16:57
2	0	5224046.pn. and (stat or statistic$1 or table or graph)	USPAT; US-PGPUB; EPO; JPO; DERWENT; IBM_TDB	2003/05/05 17:03
3	18080	((bar or line or circle) near2 graph)	USPAT; US-PGPUB; EPO; JPO; DERWENT; IBM_TDB	2003/05/05 17:04
4	5096	(postage adj meter$1) or psd$1 or (franking adj meter$1) or (franking adj machine$1) or (postal adj meter$1) or (postal adj machine$1)	USPAT	2003/05/05 17:04
5	31	((postage adj meter$1) or psd$1 or (franking adj meter$1) or (franking adj machine$1) or (postal adj meter$1) or (postal adj machine$1)) and (((bar or line or circle) near2 graph))	USPAT	2003/05/05 17:07
6	3519	((709/223) or (709/224)).CCLS.	USPAT; US-PGPUB; EPO; JPO; DERWENT; IBM_TDB	2003/05/05 17:08
7	6253	((709/203) or (709/217) or (709/219) or (709/218)).CCLS.	USPAT; US-PGPUB; EPO; JPO; DERWENT; IBM_TDB	2003/05/05 17:08
8	202	705/60.ccls. or 705/61.ccls. or 705/62.ccls. or 705/63.ccls.	USPAT; US-PGPUB; EPO; JPO; DERWENT; IBM_TDB	2003/05/05 17:21
9	614	(((709/223) or (709/224)).CCLS.) and (((709/203) or (709/217) or (709/219) or (709/218)).CCLS.)	USPAT; US-PGPUB; EPO; JPO; DERWENT; IBM_TDB	2003/05/05 17:21
10	0	(((709/223) or (709/224)).CCLS.) and (705/60.ccls. or 705/61.ccls. or 705/62.ccls. or 705/63.ccls.)	USPAT; US-PGPUB; EPO; JPO; DERWENT; IBM_TDB	2003/05/05 17:21
11	2	(705/60.ccls. or 705/61.ccls. or 705/62.ccls. or 705/63.ccls.) and (((709/203) or (709/217) or (709/219) or (709/218)).CCLS.)	USPAT; US-PGPUB; EPO; JPO; DERWENT; IBM_TDB	2003/05/05 17:21
12	1019	((off adj line) or (dis adj connect$2) or disconnect$2 or offline) near8 (franking or (atm adj machine$1) or (teller adj machine$1) meter$1 or kiosk$1 or psd or (tax adj stamp))	USPAT; US-PGPUB; EPO; JPO; DERWENT; IBM_TDB	2003/05/05 18:05
13	0	(((off adj line) or (dis adj connect$2) or disconnect$2 or offline) near8 (franking or (atm adj machine$1) or (teller adj machine$1) meter$1 or kiosk$1 or psd or (tax adj stamp))) and ((705/60.ccls. or 705/61.ccls. or 705/62.ccls. or 705/63.ccls.) and (((709/203) or (709/217) or (709/219) or (709/218)).CCLS.))	USPAT; US-PGPUB; EPO; JPO; DERWENT; IBM_TDB	2003/05/05 18:05

14	67930	display$3 with (table$1 or chart$1)	USPAT; US-PGPUB; EPO; JPO; DERWENT; IBM_TDB	2003/05/05 18:06
15	755	345/440.ccls. or 345/440.2.ccls.	USPAT; US-PGPUB; EPO; JPO; DERWENT; IBM_TDB	2003/05/05 18:08
16	12	(345/440.ccls. or 345/440.2.ccls.) and 705/$.ccls.	USPAT; US-PGPUB; EPO; JPO; DERWENT; IBM_TDB	2003/05/05 18:16
17	5346	pitney adj bowes.asn.	USPAT; US-PGPUB; EPO; JPO; DERWENT; IBM_TDB	2003/05/05 18:10
18	0	(pitney adj bowes.asn.) and (345/440.ccls. or 345/440.2.ccls.)	USPAT; US-PGPUB; EPO; JPO; DERWENT; IBM_TDB	2003/05/05 18:10
19	57427	345/$.ccls.	USPAT; US-PGPUB; EPO; JPO; DERWENT; IBM_TDB	2003/05/05 18:10
20	25	345/$.ccls. and (pitney adj bowes.asn.)	USPAT; US-PGPUB; EPO; JPO; DERWENT; IBM_TDB	2003/05/05 18:13
21	5	(345/440.ccls. or 345/440.2.ccls.) and (((709/223) or (709/224)).CCLS.)	USPAT; US-PGPUB; EPO; JPO; DERWENT; IBM_TDB	2003/05/05 18:13
22	2915	(table or chart or spreadsheet or matrix or list$1) near4 (print$3 adj head$1)	USPAT; US-PGPUB; EPO; JPO; DERWENT; IBM_TDB	2003/05/05 18:18
23	3553	(table or chart or spreadsheet or matrix or list$1) near7(print$3 adj head$1)	USPAT; US-PGPUB; EPO; JPO; DERWENT; IBM_TDB	2003/05/05 18:20
24	1	((table or chart or spreadsheet or matrix or list$1) near7(print$3 adj head$1)) and (345/440.ccls. or 345/440.2.ccls.)	USPAT; US-PGPUB; EPO; JPO; DERWENT; IBM_TDB	2003/05/05 18:19
25	33	345/$.ccls. and ((table or chart or spreadsheet or matrix or list$1) near7(print$3 adj head$1))	USPAT; US-PGPUB; EPO; JPO; DERWENT; IBM_TDB	2003/05/05 18:20

26	2038	(table or chart or spreadsheet or matrix or list$1) adj3(print$3 adj head$1)	USPAT; US-PGPUB; EPO; JPO; DERWENT; IBM_TDB	2003/05/05 18:21
27	45	(display$3 with (table$1 or chart$1)) and ((table or chart or spreadsheet or matrix or list$1) near7(print$3 adj head$1))	USPAT; US-PGPUB; EPO; JPO; DERWENT; IBM_TDB	2003/05/05 18:39
28	3	latest adj3 invoice$1	USPAT; US-PGPUB; EPO; JPO; DERWENT; IBM_TDB	2003/05/05 18:40
29	6	(((off adj line) or (dis adj connect$2) or disconnect$2 or offline) near8 (franking or (atm adj machine$1) or (teller adj machine$1) meter$1 or kiosk$1 or psd or (tax adj stamp))) and invoice$1	USPAT; US-PGPUB; EPO; JPO; DERWENT; IBM_TDB	2003/05/05 18:41
30	5	(((off adj line) or (dis adj connect$2) or disconnect$2 or offline) near8 (franking or (atm adj machine$1) or (teller adj machine$1) meter$1 or kiosk$1 or psd or (tax adj stamp))) and (705/60.ccls. or 705/61.ccls. or 705/62.ccls. or 705/63.ccls.)	USPAT; US-PGPUB; EPO; JPO; DERWENT; IBM_TDB	2003/05/05 18:42
31	295	705/401.ccls. or 705/403.ccls.	USPAT; US-PGPUB; EPO; JPO; DERWENT; IBM_TDB	2003/05/05 18:42
32	8	(705/401.ccls. or 705/403.ccls.) and (((off adj line) or (dis adj connect$2) or disconnect$2 or offline) near8 (franking or (atm adj machine$1) or (teller adj machine$1) meter$1 or kiosk$1 or psd or (tax adj stamp)))	USPAT; US-PGPUB; EPO; JPO; DERWENT; IBM_TDB	2003/05/05 18:45
33	45	latest and (345/440.ccls. or 345/440.2.ccls.)	USPAT; US-PGPUB; EPO; JPO; DERWENT; IBM_TDB	2003/05/05 18:46
34	16	latest and (705/60.ccls. or 705/61.ccls. or 705/62.ccls. or 705/63.ccls.)	USPAT; US-PGPUB; EPO; JPO; DERWENT; IBM_TDB	2003/05/05 18:51
35	19987	705/$.ccls.	USPAT; US-PGPUB; EPO; JPO; DERWENT; IBM_TDB	2003/05/05 18:51
36	87	705/$.ccls. and (((off adj line) or (dis adj connect$2) or disconnect$2 or offline) near8 (franking or (atm adj machine$1) or (teller adj machine$1) meter$1 or kiosk$1 or psd or (tax adj stamp)))	USPAT; US-PGPUB; EPO; JPO; DERWENT; IBM_TDB	2003/05/05 18:51
37	3	(705/$.ccls. and (((off adj line) or (dis adj connect$2) or disconnect$2 or offline) near8 (franking or (atm adj machine$1) or (teller adj machine$1) meter$1 or kiosk$1 or psd or (tax adj stamp)))) and invoice$1	USPAT; US-PGPUB; EPO; JPO; DERWENT; IBM_TDB	2003/05/05 18:52

-	3	("5875301").PN.	USPAT; EPO; DERWENT; USOCR	2001/07/12 14:59
-	0	(("5875301").PN.) and (address near10 translat$4)	USPAT; EPO; DERWENT; USOCR	2001/07/02 14:43
-	0	(("5875301").PN.) and (address near10 chang$4)	USPAT; EPO; DERWENT; USOCR	2001/07/02 14:35
-	0	(("5875301").PN.) and (address same translation$1)	USPAT; EPO; DERWENT; USOCR	2001/07/02 14:43
-	2	(("5875301").PN.) and reset	USPAT; EPO; DERWENT; USOCR	2001/07/02 14:43
-	3	("5751967").PN.	USPAT; EPO; DERWENT; USOCR	2001/07/02 14:43
-	0	(("5751967").PN.) and stale	USPAT; EPO; DERWENT; USOCR	2001/07/02 14:43
-	0	(("5751967").PN.) and (address near10 translat$4)	USPAT; EPO; DERWENT; USOCR	2001/07/02 14:43
-	0	(("5751967").PN.) and (address same translation$1)	USPAT; EPO; DERWENT; USOCR	2001/07/02 15:19
-	6	(("5696965") or ("5559496")).PN.	USPAT; EPO; DERWENT; USOCR	2001/07/02 15:19
-	3	((("5696965") or ("5559496")).PN.) AND (TRAFFIC OR HIT$1)	USPAT; EPO; DERWENT; USOCR	2001/07/02 15:29
-	4	((("5696965") or ("5559496")).PN.) AND monitor$3	USPAT; EPO; DERWENT; USOCR	2001/07/02 16:52
-	11	705/401 and (offline or (off adj line))	USPAT; EPO; DERWENT; USOCR	2001/07/02 17:03
-	82	705/401 and network	USPAT; EPO; DERWENT; USOCR	2001/07/02 17:05
-	3299	(plurality or multiple or group$1) adj3 (meter$3 or frank$3)	USPAT; EPO; DERWENT; USOCR	2001/07/02 17:08

-	27	((plurality or multiple or group$1) adj3 (meter$3 or frank$3)) and 705/401	USPAT; EPO; DERWENT; USOCR	2001/07/12 15:50
-	827	(709/224).CCLS.	USPAT; EPO; DERWENT; USOCR	2001/07/02 17:15
-	0	705/401 and (("709/224").CCLS.)	USPAT; EPO; DERWENT; USOCR	2001/07/02 17:16
-	1005	705/40$.ccls.	USPAT; EPO; DERWENT; USOCR	2001/07/02 17:17
-	2	(("709/224").CCLS.) and 705/40$.ccls.	USPAT; EPO; DERWENT; USOCR	2001/07/02 17:16
-	1005	705/4$$.ccls. and 705/40$.ccls.	USPAT; EPO; DERWENT; USOCR	2001/07/05 11:44
-	2	705/4$$.ccls. and (("709/224").CCLS.)	USPAT; EPO; DERWENT; USOCR	2001/07/02 17:17
-	23300	offline or (off adj line)	USPAT; EPO; DERWENT; USOCR	2001/07/02 17:26
-	70	(offline or (off adj line)) and (("709/224").CCLS.)	USPAT; EPO; DERWENT; USOCR	2001/07/02 17:28
-	486	monitor$3 near6 (offline or (off adj line))	USPAT; EPO; DERWENT; USOCR	2001/07/02 17:29
-	0	(monitor$3 near6 (offline or (off adj line))) AND 705/40$.ccls.	USPAT; EPO; DERWENT; USOCR	2001/07/02 17:30
-	810	monitor$3 WITH (offline or (off adj line))	USPAT; EPO; DERWENT; USOCR	2001/07/02 17:30
-	0	(monitor$3 WITH (offline or (off adj line))) AND 705/40$.ccls.	USPAT; EPO; DERWENT; USOCR	2001/07/02 17:29
-	330	MANAG$6 WITH (offline or (off adj line))	USPAT; EPO; DERWENT; USOCR	2001/07/02 17:32
-	15	(monitor$3 near6 (offline or (off adj line))) AND (("709/224").CCLS.)	USPAT; EPO; DERWENT; USOCR	2001/07/02 17:30

-	15	(monitor$3 near6 (offline or (off adj line))) AND (("709/224").CCLS.)	USPAT; EPO; DERWENT; USOCR	2001/07/02 17:30
-	15	(MANAG$6 WITH (offline or (off adj line))) AND (("709/224").CCLS.)	USPAT; EPO; DERWENT; USOCR	2001/07/02 17:46
-	840	MANAGEMENT ADJ SERVER$1	USPAT; EPO; DERWENT; USOCR	2001/07/02 17:46
-	57	(MANAGEMENT ADJ SERVER$1) AND (METER$1 OR FRANK$3)	USPAT; EPO; DERWENT; USOCR	2001/07/02 17:50
-	2	(MANAGEMENT ADJ SERVER$1) AND 705/401	USPAT; EPO; DERWENT; USOCR	2001/07/02 17:50
-	342	705/4$$.ccls. AND FRANK$3	USPAT; EPO; DERWENT; USOCR	2001/07/02 18:18
-	226	(EXTERNAL ADJ NETWORK$1) AND (INTERNAL ADJ NETWORK)	USPAT; EPO; DERWENT; USOCR	2001/07/02 18:20
-	0	705/401 AND ((EXTERNAL ADJ NETWORK$1) AND (INTERNAL ADJ NETWORK))	USPAT; EPO; DERWENT; USOCR	2001/07/02 18:19
-	3	705/4$$.ccls. AND ((EXTERNAL ADJ NETWORK$1) AND (INTERNAL ADJ NETWORK))	USPAT; EPO; DERWENT; USOCR	2001/07/02 18:19
-	1861	(EXTERNAL ADJ NETWORK$1)	USPAT; EPO; DERWENT; USOCR	2001/07/02 18:20
-	6	((EXTERNAL ADJ NETWORK$1)) AND 705/4$$.ccls.	USPAT; EPO; DERWENT; USOCR	2001/07/03 16:11
-	8	(("6233565") or ("6151591") or ("6085181") or ("6081795")).PN.	USPAT; EPO; DERWENT; USOCR	2001/07/03 16:14
-	2783	remote and meter and post$3	USPAT; EPO; DERWENT; USOCR	2001/07/03 16:15
-	6596	705/$.ccls.	USPAT; EPO; DERWENT; USOCR	2001/07/03 16:15
-	396	705/$.ccls. and (remote and meter and post$3)	USPAT; EPO; DERWENT; USOCR	2001/07/03 16:15

-	11026	709/$.ccls.	USPAT; EPO; DERWENT; USOCR	2001/07/03 16:15
-	3	709/$.ccls. and (705/$.ccls. and (remote and meter and post$3))	USPAT; EPO; DERWENT; USOCR	2001/07/03 16:15
-	218	705/401	USPAT; EPO; DERWENT; USOCR	2001/07/03 16:26
-	1	705/401 and proxy	USPAT; EPO; DERWENT; USOCR	2001/07/03 16:26
-	2154	705/4$$.ccls.	USPAT; EPO; DERWENT; USOCR	2001/07/03 16:27
-	322	(709/202).CCLS.	USPAT; EPO; DERWENT; USOCR	2001/07/03 16:28
-	22	705/4$$.ccls. and proxy	USPAT; EPO; DERWENT; USOCR	2001/07/03 16:32
-	342	705/4$$.ccls. and frank$3	USPAT; EPO; DERWENT; USOCR	2001/07/03 16:32
-	6	(705/4$$.ccls. and frank$3) and (firewall$1 or gateway$1 or router41)	USPAT; EPO; DERWENT; USOCR	2001/07/03 16:33
-	8	(705/4$$.ccls. and frank$3) and (firewall$1 or gateway$1 or router$1)	USPAT; EPO; DERWENT; USOCR	2001/07/03 16:34
-	3137	(postage$1 or postal) same meter$3	USPAT; EPO; DERWENT; USOCR	2001/07/03 16:34
-	4	((postage$1 or postal) same meter$3) same (firewall$1 or router$1 or proxy or gateway$1)	USPAT; EPO; DERWENT; USOCR	2001/07/03 16:35
-	2555	(trust$2 or internal) adj3 network	USPAT; EPO; DERWENT; USOCR	2001/07/05 11:40
-	25	((trust$2 or internal) adj3 network) and (("709/249").CCLS.)	USPAT; EPO; DERWENT; USOCR	2001/07/05 11:40
-	0	705/4$$.ccls	USPAT; EPO; DERWENT; USOCR	2001/07/05 11:44

-	2154	705/4$$.ccls.	USPAT; EPO; DERWENT; USOCR	2001/07/05 11:44
-	31	705/4$$.ccls. and ((trust$2 or internal) adj3 network)	USPAT; EPO; DERWENT; USOCR	2001/07/05 11:44
-	277	(709/249).CCLS.	USPAT; EPO; DERWENT; USOCR	2001/07/05 11:57
-	1244	((709/223) or (709/224)).CCLS.	USPAT; EPO; DERWENT; USOCR	2001/07/05 11:58
-	36	(("709/249").CCLS.) and ((("709/223") or ("709/224")).CCLS.)	USPAT; EPO; DERWENT; USOCR	2001/07/05 12:04
-	0	705/4$$.ccls and kiosk	USPAT; EPO; DERWENT; USOCR	2001/07/05 12:04
-	0	705/4$$.ccls and kiosk$1	USPAT; EPO; DERWENT; USOCR	2001/07/05 12:04
-	51	705/4$$.ccls. and kiosk	USPAT; EPO; DERWENT; USOCR	2001/07/05 12:22
-	2	(offline or (off adj line))near10 kiosk	USPAT; EPO; DERWENT; USOCR	2001/07/05 12:34
-	5	kiosk and franking	USPAT; EPO; DERWENT; USOCR	2001/07/05 12:35
-	23	kiosk and meter$3 and (postage or postal)	USPAT; EPO; DERWENT; USOCR	2001/07/05 14:29
-	124	kiosk$1 near10 remote	USPAT; EPO; DERWENT; USOCR	2001/07/05 14:30
-	6596	705/$.ccls.	USPAT; EPO; DERWENT; USOCR	2001/07/05 14:31
-	30	(kiosk$1 near10 remote) and 705/$.ccls.	USPAT; EPO; DERWENT; USOCR	2001/07/05 14:36
-	0	((kiosk$1 near10 remote) and 705/$.ccls.) and intranet	USPAT; EPO; DERWENT; USOCR	2001/07/05 14:32

-	25	kiosk$1 same intranet	USPAT; EPO; DERWENT; USOCR	2001/07/05 14:43
-	76481	remote$2 near10 (log or connect$4)	USPAT; EPO; DERWENT; USOCR	2001/07/05 14:45
-	175	(remote$2 near10 (log or connect$4)) and kiosk$1	USPAT; EPO; DERWENT; USOCR	2001/07/05 14:44
-	32	((remote$2 near10 (log or connect$4)) and kiosk$1) and (firewall$1 or intranet or proxy)	USPAT; EPO; DERWENT; USOCR	2001/07/05 14:44
-	944	remote$2 near10 log	USPAT; EPO; DERWENT; USOCR	2001/07/05 14:45
-	2	(remote$2 near10 log) same kiosk$1	USPAT; EPO; DERWENT; USOCR	2001/07/05 14:45
-	69	intranet and kiosk$1	USPAT; EPO; DERWENT; USOCR	2001/07/11 18:28
-	948	internal adj network	USPAT; EPO; DERWENT; USOCR	2001/07/11 18:28
-	2	(internal adj network) and kiosk$1	USPAT; EPO; DERWENT; USOCR	2001/07/11 18:29
-	56	(internal adj network) and 705/$.ccls.	USPAT; EPO; DERWENT; USOCR	2001/07/11 18:30
-	32	(internal adj network) and offline	USPAT; EPO; DERWENT; USOCR	2001/07/11 18:32
-	587	kiosk$1 and network	USPAT; EPO; DERWENT; USOCR	2001/07/11 18:33
-	67	(kiosk$1 and network) and intranet	USPAT; EPO; DERWENT; USOCR	2001/07/11 18:34
-	29	(multiple or plurality or group) adj2 kiosk$1	USPAT; EPO; DERWENT; USOCR	2001/07/11 18:35
-	3891	(postage$1 or postal or franking) adj1 (meter$3 or device$1 or machine$1)	USPAT; EPO; DERWENT; USOCR	2001/07/12 17:14

-	22	(("6249777") or ("6026385") or ("6010069") or ("6151591") or ("5909373") or ("6081795") or ("5822739") or ("6058193") or ("5970150") or ("4831555")).PN.	USPAT; EPO; DERWENT; USOCR	2001/07/12 15:02
-	350299	mobile or wireless or cellular	USPAT; EPO; DERWENT; USOCR	2001/07/12 15:02
-	0	((("6249777") or ("6026385") or ("6010069") or ("6151591") or ("5909373") or ("6081795") or ("5822739") or ("6058193") or ("5970150") or ("4831555")).PN.) and (mobile or wireless or cellular)	USPAT; EPO; DERWENT; USOCR	2001/07/12 15:02
-	107	((postage$1 or postal or franking) adj1 (meter$3 or device$1 or machine$1)) and (mobile or wireless or cellular)	USPAT; EPO; DERWENT; USOCR	2001/07/12 15:02
-	5707	pitney adj bowes.asn.	USPAT; EPO; DERWENT; USOCR	2001/07/12 15:03
-	30	(((postage$1 or postal or franking) adj1 (meter$3 or device$1 or machine$1)) and (mobile or wireless or cellular)) and (pitney adj bowes.asn.)	USPAT; EPO; DERWENT; USOCR	2001/07/12 15:07
-	12	(offline or (off adj1 line)) with ((postage$1 or postal or franking) adj1 (meter$3 or device$1 or machine$1))	USPAT; EPO; DERWENT; USOCR	2001/07/12 15:44
-	485	neopost.asn.	USPAT; EPO; DERWENT; USOCR	2001/07/12 15:46
-	3283	(plurality or multiple or group$1) adj3 (meter$3 or franking)	USPAT; EPO; DERWENT; USOCR	2001/07/12 16:31
-	58	((plurality or multiple or group$1) adj3 (meter$3 or franking)) and internet	USPAT; EPO; DERWENT; USOCR	2001/07/12 15:52
-	16492	(meter$3 or franking) adj1 (machine$1 or device$1)	USPAT; EPO; DERWENT; USOCR	2001/07/12 15:58
-	7	((meter$3 or franking) adj1 (machine$1 or device$1)) same (browser$1 or internet)	USPAT; EPO; DERWENT; USOCR	2001/07/12 16:01
-	2161	705/4$$.ccls.	USPAT; EPO; DERWENT; USOCR	2001/07/12 16:01
-	96	705/4$$.ccls. and browser$1	USPAT; EPO; DERWENT; USOCR	2001/07/12 16:01
-	2846	(postal or postage or franking) adj (meter$1 or device)	USPAT; EPO; DERWENT; USOCR	2001/07/12 16:23

-	63	((postal or postage or franking) adj (meter$1 or device)) with traditional	USPAT; EPO; DERWENT; USOCR	2001/07/12 16:23
-	113	((postage$1 or postal or franking) adj1 (meter$3 or device$1 or machine$1)) adj2 plurality	USPAT; EPO; DERWENT; USOCR	2001/07/12 16:32
-	44	(((postage$1 or postal or franking) adj1 (meter$3 or device$1 or machine$1)) adj2 plurality) and 705/4$$.ccls.	USPAT; EPO; DERWENT; USOCR	2001/07/12 16:32
-	54	plurality adj1 (postage$1 or postal or franking) adj1 (meter$3 or device$1 or machine$1)	USPAT; EPO; DERWENT; USOCR	2001/07/12 16:35
-	634	connected with ((postage$1 or postal or franking) adj1 (meter$3 or device$1 or machine$1))	USPAT; EPO; DERWENT; USOCR	2001/07/12 16:35
-	241	(connected with ((postage$1 or postal or franking) adj1 (meter$3 or device$1 or machine$1))) and 705/4$$.ccls.	USPAT; EPO; DERWENT; USOCR	2001/07/12 16:36
-	9	((connected with ((postage$1 or postal or franking) adj1 (meter$3 or device$1 or machine$1))) and 705/4$$.ccls.) and server$1	USPAT; EPO; DERWENT; USOCR	2001/07/12 17:01
-	1547	((709/217) or (709/218) or (709/219)).CCLS.	USPAT; EPO; DERWENT; USOCR	2001/07/12 17:01
-	16	((("709/217") or ("709/218") or ("709/219")).CCLS.) and 705/4$$.ccls.	USPAT; EPO; DERWENT; USOCR	2001/07/12 17:02
-	27	soda adj machine$1	USPAT; EPO; DERWENT; USOCR	2001/07/12 17:03
-	17261	(vend$3 or soda) adj1 machine$1	USPAT; EPO; DERWENT; USOCR	2001/07/12 17:05
-	7	ups.asn.	USPAT; EPO; DERWENT; USOCR	2001/07/12 17:05
-	0	united adj postal adj service.asn.	USPAT; EPO; DERWENT; USOCR	2001/07/12 17:06
-	5	united adj parcel adj services.asn.	USPAT; EPO; DERWENT; USOCR	2001/07/12 17:06
-	433	united adj parcel adj service.asn.	USPAT; EPO; DERWENT; USOCR	2001/07/12 17:06

-	3	(united adj parcel adj service.asn.) and handheld	USPAT; EPO; DERWENT; USOCR	2001/07/12 17:07
-	4	(united adj parcel adj service.asn.) and server$1	USPAT; EPO; DERWENT; USOCR	2001/07/12 17:08
-	606	705/4$$.ccls. and scan$4	USPAT; EPO; DERWENT; USOCR	2001/07/12 17:09
-	57	(705/4$$.ccls. and scan$4) and (handheld or (hand adj held))	USPAT; EPO; DERWENT; USOCR	2001/07/12 17:10
-	5	(pitney adj bowes.asn.) and ((705/4$$.ccls. and scan$4) and (handheld or (hand adj held)))	USPAT; EPO; DERWENT; USOCR	2001/07/12 17:11
-	12	((postage$1 or postal or franking) adj1 (meter$3 or device$1 or machine$1)) and (handheld or (hand adj held)) and (pitney adj bowes.asn.) and scan$4	USPAT; EPO; DERWENT; USOCR	2001/07/12 17:12
-	12	(offline or (off adj line)) with ((postage$1 or postal or franking) adj1 (meter$3 or device$1 or machine$1))	USPAT; EPO; DERWENT; USOCR	2001/07/12 17:26
-	302	((postage$1 or postal or franking) adj1 (meter$3 or device$1 or machine$1)) same (upgrad$3 or updat$3)	USPAT; EPO; DERWENT; USOCR	2001/07/12 17:26
-	171	(((postage$1 or postal or franking) adj1 (meter$3 or device$1 or machine$1)) same (upgrad$3 or updat$3)) and 705/4$$.ccls.	USPAT; EPO; DERWENT; USOCR	2001/07/12 17:28
-	44	((((postage$1 or postal or franking) adj1 (meter$3 or device$1 or machine$1)) same (upgrad$3 or updat$3)) and 705/4$$.ccls.) and (psd or authorization)	USPAT; EPO; DERWENT; USOCR	2001/07/12 17:29
-	0	(709/224, "223").CCLS.	USPAT; EPO; DERWENT; USOCR	2001/07/12 17:30
-	836	(709/224).CCLS.	USPAT; EPO; DERWENT; USOCR	2001/07/12 17:31
-	2	(("709/224").CCLS.) and 705/4$$.ccls.	USPAT; EPO; DERWENT; USOCR	2001/07/12 17:31
-	614	(709/223).CCLS.	USPAT; EPO; DERWENT; USOCR	2001/07/12 17:31
-	3	(("709/223").CCLS.) and 705/4$$.ccls.	USPAT; EPO; DERWENT; USOCR	2001/07/12 17:32

-	0	(pitney adj bowes.asn.) and (("709/224").CCLS.)	USPAT; EPO; DERWENT; USOCR	2001/07/12 17:32
-	1	(pitney adj bowes.asn.) and (("709/223").CCLS.)	USPAT; EPO; DERWENT; USOCR	2001/07/12 17:35
-	1	("6249777").PN.	USPAT; EPO; DERWENT; USOCR	2001/07/12 17:35
-	1	(("6249777").PN.) and server$1	USPAT; EPO; DERWENT; USOCR	2001/07/12 18:38
-	30	(("4831555") or ("5202834") or ("5822739") or ("5918217") or ("5956391") or ("5970150") or ("6009417") or ("6010069") or ("6029151") or ("6151591") or ("6240403") or ("6249777") or ("6233565") or ("6230149")).PN.	USPAT; EPO; DERWENT; USOCR	2001/07/12 19:50
-	2	("6233565").PN.	USPAT; EPO; DERWENT; USOCR	2001/07/12 19:50
-	1	(("6233565").PN.) and ((off adj line) or offline)	USPAT; EPO; DERWENT; USOCR	2001/07/12 19:51
-	2	("6230149").PN.	USPAT; EPO; DERWENT; USOCR	2001/07/12 19:51
-	0	(("6230149").PN.) and ((off adj line) or offline)	USPAT; EPO; DERWENT; USOCR	2001/07/12 19:52
-	16	((postage or postal) adj (meter$1)) same ((off adj line) or offline)	USPAT; EPO; DERWENT; USOCR	2001/07/12 19:53
-	5797	pitney adj bowes.asn.	USPAT; EPO; DERWENT; USOCR	2001/12/14 16:25
-	6228	pitney adj bowes.as.	USPAT; EPO; DERWENT; USOCR	2001/12/14 16:25
-	6861	pitney bowes.as.	USPAT; EPO; DERWENT; USOCR	2001/12/14 16:25
-	6943	pitney bowe.as.	USPAT; EPO; DERWENT; USOCR	2001/12/14 16:25
-	2374	(pitney adj bowes.asn.) and postage$1	USPAT; EPO; DERWENT; USOCR	2001/12/14 16:31

-	2090	(pitney adj bowes.asn.) and meter$3	USPAT; EPO; DERWENT; USOCR	2001/12/14 16:47
-	296	(pitney adj bowes.asn.) and network$3	USPAT; EPO; DERWENT; USOCR	2001/12/14 16:48
-	13491	mechanical same (meter$3 or postage$1 or frank$3)	USPAT; EPO; DERWENT; USOCR	2001/12/27 16:13
-	7052	705/$.ccls.	USPAT; EPO; DERWENT; USOCR	2001/12/27 16:14
-	314	(mechanical same (meter$3 or postage$1 or frank$3)) and 705/$.ccls.	USPAT; EPO; DERWENT; USOCR	2001/12/27 16:14
-	90	((mechanical same (meter$3 or postage$1 or frank$3)) and 705/$.ccls.) and encrypt$4	USPAT; EPO; DERWENT; USOCR	2001/12/27 16:16
-	88	(mechanical near3 (post$3 adj meter$4)) and 705/$.ccls.	USPAT; EPO; DERWENT; USOCR	2001/12/31 07:41
-	28	((mechanical near3 (post$3 adj meter$4)) and 705/$.ccls.) and network$3	USPAT; EPO; DERWENT; USOCR	2001/12/27 16:25
-	9	(("3792446") or ("4097923") or ("4447890")).PN.	USPAT; EPO; DERWENT; USOCR	2001/12/27 16:27
-	5806	pitney adj bowes.asn.	USPAT; EPO; DERWENT; USOCR	2001/12/27 16:28
-	120	(pitney adj bowes.asn.) and (mechanical near3 (post$3 adj meter$4))	USPAT; EPO; DERWENT; USOCR	2001/12/27 16:38
-	476	frank$3 and (pitney adj bowes.asn.)	USPAT; EPO; DERWENT; USOCR	2001/12/27 16:38
-	100	(frank$3 and (pitney adj bowes.asn.)) and reset$4	USPAT; EPO; DERWENT; USOCR	2001/12/27 16:38
-	30	((frank$3 and (pitney adj bowes.asn.)) and reset$4) and modem$1	USPAT; EPO; DERWENT; USOCR	2001/12/27 16:38
-	9	reset$4 with (mechanical near3 (post$3 adj meter$4))	USPAT; EPO; DERWENT; USOCR	2001/12/27 16:50

-	2	updat$3 with (mechanical near3 (post$3 adj meter$4))	USPAT; EPO; DERWENT; USOCR	2001/12/27 16:50
-	9	reset$4 near30 (mechanical near3 (post$3 adj meter$4))	USPAT; EPO; DERWENT; USOCR	2001/12/27 16:53
-	184	mechanical near3 (post$3 adj meter$4)	USPAT; EPO; DERWENT; USOCR	2001/12/27 16:56
-	211	electromechanical adj2 (meter$3 or frank$3)	USPAT; EPO; DERWENT; USOCR	2001/12/27 17:18
-	273	recharg$3 near3 meter$1	USPAT; EPO; DERWENT; USOCR	2001/12/27 17:19
-	124	(recharg$3 near3 meter$1) and 705/$.ccls.	USPAT; EPO; DERWENT; USOCR	2001/12/27 17:20
-	156	evidenc$3 adj device$1	USPAT; EPO; DERWENT; USOCR	2001/12/27 17:22
-	66	((recharg$3 near3 meter$1) and 705/$.ccls.) and (mechanical same (meter$3 or postage$1 or frank$3))	USPAT; EPO; DERWENT; USOCR	2001/12/27 17:24
-	1137	frank$3 adj machine$1	USPAT; EPO; DERWENT; USOCR	2001/12/27 17:28
-	140	(frank$3 adj machine$1) and 705/$.ccls.	USPAT; EPO; DERWENT; USOCR	2001/12/27 17:25
-	17	plurality adj3 (frank$3 adj machine$1)	USPAT; EPO; DERWENT; USOCR	2001/12/27 17:31
-	70	plurality adj3 (postage adj meter$1)	USPAT; EPO; DERWENT; USOCR	2001/12/27 17:32
-	88	(mechanical near3 (post$3 adj meter$4)) and 705/$.ccls.	USPAT; EPO; DERWENT; USOCR	2001/12/31 07:42
-	64	((mechanical near3 (post$3 adj meter$4)) and 705/$.ccls.) and (reset$4 or recharg$4)	USPAT; EPO; DERWENT; USOCR	2001/12/31 07:46
-	10	remote$2 near3 (reset$4 or recharg$4) near3 mechanical	USPAT; EPO; DERWENT; USOCR	2001/12/31 07:53

-	28	(("4097923") or ("4752950") or ("5224046") or ("5309363") or ("5323323") or ("5384708") or ("5699258") or ("5701250") or ("5715164") or ("5717596")).PN.	USPAT; EPO; DERWENT; USOCR	2001/12/31 08:43
-	1347	videotex or videotext	USPAT; EPO; DERWENT; USOCR	2001/12/31 08:43
-	42	(videotex or videotext) and 705/$.ccls.	USPAT; EPO; DERWENT; USOCR	2001/12/31 09:35
-	57	kiosk and 705/4$$.ccls.	USPAT; EPO; DERWENT; USOCR	2001/12/31 08:46
-	25	kiosk and 705/40$.ccls.	USPAT; EPO; DERWENT; USOCR	2001/12/31 09:17
-	8838	wright.inv.	USPAT; EPO; DERWENT; USOCR	2001/12/31 09:18
-	7052	705/$.ccls.	USPAT; EPO; DERWENT; USOCR	2001/12/31 09:18
-	8	705/$.ccls. and wright.inv.	USPAT; EPO; DERWENT; USOCR	2001/12/31 09:20
-	4089	(postal adj meter$1) or (postage adj meter$1) or franking	USPAT; EPO; DERWENT; USOCR	2001/12/31 09:21
-	0	((postal adj meter$1) or (postage adj meter$1) or franking) and (videotex or videotext)	USPAT; EPO; DERWENT; USOCR	2001/12/31 09:21
-	27	teletel	USPAT; EPO; DERWENT; USOCR	2001/12/31 09:25
-	821	mechanical adj2 meter$1	USPAT; EPO; DERWENT; USOCR	2001/12/31 09:26
-	95	(mechanical adj2 meter$1) and 705/$.ccls.	USPAT; EPO; DERWENT; USOCR	2001/12/31 09:26
-	3	((mechanical adj2 meter$1) and 705/$.ccls.) and server$1	USPAT; EPO; DERWENT; USOCR	2001/12/31 09:28
-	75	((mechanical adj2 meter$1) and 705/$.ccls.) and computer$1	USPAT; EPO; DERWENT; USOCR	2001/12/31 09:29

-	13	(customer adj service adj (agent or representative)) and ((postal adj meter$1) or (postage adj meter$1) or franking)	USPAT; EPO; DERWENT; USOCR	2001/12/31 09:38
-	14	online and ((postal adj meter$1) or (postage adj meter$1) or franking)	USPAT; EPO; DERWENT; USOCR	2001/12/31 09:38
-	70	server$1 and (ATM adj machine)	USPAT; EPO; DERWENT; USOCR	2002/01/03 14:36
-	7066	705/$.ccls.	USPAT; EPO; DERWENT; USOCR	2002/01/03 14:36
-	24	(server$1 and (ATM adj machine)) and 705/$.ccls.	USPAT; EPO; DERWENT; USOCR	2002/01/03 14:37
-	385	server$1 and 705/4$$.ccls.	USPAT; EPO; DERWENT; USOCR	2002/01/03 14:38
-	95	(server$1 and 705/4$$.ccls.) and (postage or frank$3)	USPAT; EPO; DERWENT; USOCR	2002/01/03 14:48
-	14	(server$1 and 705/4$$.ccls.) and psd	USPAT; EPO; DERWENT; USOCR	2002/01/03 14:52
-	77	mechanical same psd	USPAT; EPO; DERWENT; USOCR	2002/01/03 14:53
-	243	mechanical same server$1	USPAT; EPO; DERWENT; USOCR	2002/01/03 14:53
-	8	(mechanical same server$1) and 705/$.ccls.	USPAT; EPO; DERWENT; USOCR	2002/01/03 15:02
-	219	voting adj machine$1	USPAT; EPO; DERWENT; USOCR	2002/01/03 14:57
-	14	(voting adj machine$1) and 705/$.ccls.	USPAT; EPO; DERWENT; USOCR	2002/01/03 14:57
-	18	mechanical adj2 frank$4	USPAT; EPO; DERWENT; USOCR	2002/01/03 15:03
-	751	plurality adj2 (meter$1 or frank$3 or psd)	USPAT; EPO; DERWENT; USOCR	2002/01/03 15:06

-	77	(plurality adj2 (meter$1 or frank$3 or psd)) and 705/$.ccls.	USPAT; EPO; DERWENT; USOCR	2002/01/03 15:08
-	0	plurality adj2 mechanical adj2 (meter$1 or frank$3 or psd)	USPAT; EPO; DERWENT; USOCR	2002/01/03 15:06
-	5595	meter$1 same network$3	USPAT; EPO; DERWENT; USOCR	2002/01/03 15:09
-	159	(meter$1 same network$3) and 705/$.ccls.	USPAT; EPO; DERWENT; USOCR	2002/01/03 15:09
-	103	((meter$1 same network$3) and 705/$.ccls.) and (postage or postal)	USPAT; EPO; DERWENT; USOCR	2002/01/03 15:11
-	236	(plurality adj2 (meter$1 or frank$3 or psd)) and (recharg$3 or reset$4 or (re adj charg$3) or (re adj set$4))	USPAT; EPO; DERWENT; USOCR	2002/01/03 15:14
-	48	((plurality adj2 (meter$1 or frank$3 or psd)) and (recharg$3 or reset$4 or (re adj charg$3) or (re adj set$4))) and 705/$.ccls.	USPAT; EPO; DERWENT; USOCR	2002/01/03 15:14
-	2	(recharg$3 or reset$4 or (re adj charg$3) or (re adj set$4)) near4 (mechanical adj2 meter$1) near10 remote$2	USPAT; EPO; DERWENT; USOCR	2002/01/03 16:14
-	3	5535126.pn.	USPAT; EPO; DERWENT; USOCR	2002/01/03 16:15
-	503	neopost$1.asn.	USPAT; EPO; DERWENT; USOCR	2002/01/03 16:15
-	227	neopost$1.asn. and postage	USPAT; EPO; DERWENT; USOCR	2002/01/03 16:15
-	47	705/$.ccls. and neopost$1.asn.	USPAT; EPO; DERWENT; USOCR	2002/01/03 16:55
-	2	("5715164").PN.	USPAT; EPO; DERWENT; USOCR	2002/01/03 17:06
-	1	("6335875").PN.	USPAT; EPO; DERWENT; USOCR	2002/01/03 17:06
-	2	("5237506").PN.	USPAT; EPO; DERWENT; USOCR	2002/02/08 11:32
-	17112	print$3 adj head$1	USPAT	2002/07/24 11:20
-	132	(print$3 adj head$1) and (frank$3 adj machine$1)	USPAT	2002/07/24 11:21
-	40	((print$3 adj head$1) and (frank$3 adj machine$1)) and 705/$.ccls.	USPAT	2002/07/24 11:32

-	1	5077792.pn.	USPAT	2002/07/24 11:35
-	1	5237506.pn.	USPAT	2002/07/24 11:35
-	1	5237506.pn. and print$3	USPAT	2002/07/24 11:35
-	6628	((postage or postal) adj2 meter$1) or PSD$1 or (postal adj security adj device$1)	USPAT; EPO; DERWENT; USOCR	2002/10/03 09:38
-	7946	705/$.ccls.	USPAT; EPO; DERWENT; USOCR	2002/10/03 09:39
-	100	(((postage or postal) adj2 meter$1) or PSD$1 or (postal adj security adj device$1)) and invoice$1	USPAT; EPO; DERWENT; USOCR	2002/10/03 09:39
-	53	((((postage or postal) adj2 meter$1) or PSD$1 or (postal adj security adj device$1)) and invoice$1) and 705/$.ccls.	USPAT; EPO; DERWENT; USOCR	2002/10/03 11:29
-	53	((((postage or postal) adj2 meter$1) or PSD$1 or (postal adj security adj device$1)) and invoice$1) and 705/$.ccls.	USPAT; EPO; DERWENT; USOCR	2002/10/03 11:34
-	335959	TCP or ip	USPAT; EPO; DERWENT; USOCR	2002/10/03 11:33
-	2	(((((postage or postal) adj2 meter$1) or PSD$1 or (postal adj security adj device$1)) and invoice$1) and 705/$.ccls.) and (TCP or ip)	USPAT	2002/10/03 11:33
-	100	((((postage or postal) adj2 meter$1) or PSD$1 or (postal adj security adj device$1)) and invoice$1)	USPAT; EPO; DERWENT; USOCR	2002/10/03 11:35
-	6	(((((postage or postal) adj2 meter$1) or PSD$1 or (postal adj security adj device$1)) and invoice$1)) and (TCP or ip)	USPAT; EPO; DERWENT; USOCR	2002/10/03 11:35
-	1896	((((postage or postal) adj2 meter$1) or PSD$1 or (postal adj security adj device$1)) and invoice$1 or franking)	USPAT; EPO; DERWENT; USOCR	2002/10/03 12:39
-	7946	705/$.ccls.	USPAT; EPO; DERWENT; USOCR	2002/10/03 11:35
-	308	705/$.ccls. and (((((postage or postal) adj2 meter$1) or PSD$1 or (postal adj security adj device$1)) and invoice$1 or franking))	USPAT; EPO; DERWENT; USOCR	2002/10/03 11:35
-	2	(705/$.ccls. and (((((postage or postal) adj2 meter$1) or PSD$1 or (postal adj security adj device$1)) and invoice$1 or franking))) and (TCP or ip)	USPAT; EPO; DERWENT; USOCR	2002/10/03 11:36
-	4998	pitney adj bowes.asn.	USPAT; EPO; DERWENT; USOCR	2002/10/03 11:36
-	7	(pitney adj bowes.asn.) and (TCP or ip)	USPAT; EPO; DERWENT; USOCR	2002/10/03 11:37

-	337671	TCP or ip) or(internet adj protocol	USPAT; EPO; DERWENT; USOCR	2002/10/03 11:37
-	7	((TCP or ip) or(internet adj protocol)) and (pitney adj bowes.asn.)	USPAT; EPO; DERWENT; USOCR	2002/10/03 11:37
-	82	(pitney adj bowes.asn.) and internet	USPAT; EPO; DERWENT; USOCR	2002/10/03 11:40
-	7	((pitney adj bowes.asn.) and internet) and (((((postage or postal) adj2 meter$1) or PSD$1 or (postal adj security adj device$1)) and invoice$1))	USPAT; EPO; DERWENT; USOCR	2002/10/03 11:42
-	29	("4639873" | "4725718" | "4734865" | "4797830" | "4831554" | "4873645" | "4959795" | "5008827" | "5024153" | "5043908" | "5058030" | "5072400" | "5168804" | "5177687" | "5384886" | "5390251" | "5454038" | "5471925" | "5490077" | "5509109" | "5579449" | "5602743" | "5724245" | "5787406" | "5801944" | "5819241" | "5822739" | "5948061" | "6029137").PN.	USPAT	2002/10/03 11:40
-	33	e adj stamp.asn.	USPAT; EPO; DERWENT; USOCR	2002/10/03 11:43
-	502	meter$1 and tcp	USPAT; EPO; DERWENT; USOCR	2002/10/03 11:44
-	7	(meter$1 and tcp) and 705/$.ccls.	USPAT; EPO; DERWENT; USOCR	2002/10/03 12:23
-	15	(print$3 near2 head$1) and (((((postage or postal) adj2 meter$1) or PSD$1 or (postal adj security adj device$1)) and invoice$1))	USPAT; EPO; DERWENT; USOCR	2002/10/03 12:24
-	383468	((((postage or postal) adj2 meter$1) or PSD$1 or (postal adj security adj device$1)) and invoice$1 or meter$1 or franking)	USPAT; EPO; DERWENT; USOCR	2002/10/03 12:25
-	50314	print$3 near2 head$1	USPAT; EPO; DERWENT; USOCR	2002/10/03 12:27
-	37864	(print adj head$1) or (printing adj head$1)	USPAT; EPO; DERWENT; USOCR	2002/10/03 12:28
-	1671	((print adj head$1) or (printing adj head$1)) and (((((postage or postal) adj2 meter$1) or PSD$1 or (postal adj security adj device$1)) and invoice$1 or meter$1 or franking))	USPAT; EPO; DERWENT; USOCR	2002/10/03 12:28
-	138	(((print adj head$1) or (printing adj head$1)) and (((((postage or postal) adj2 meter$1) or PSD$1 or (postal adj security adj device$1)) and invoice$1 or meter$1 or franking))) and 705/$.ccls.	USPAT; EPO; DERWENT; USOCR	2002/10/03 12:29
-	4	((((print adj head$1) or (printing adj head$1)) and (((((postage or postal) adj2 meter$1) or PSD$1 or (postal adj security adj device$1)) and invoice$1 or meter$1 or franking))) and 705/$.ccls.) and server$1	USPAT; EPO; DERWENT; USOCR	2002/10/03 12:30

-	249	(table$1 or list$1) near4 ((print adj head$1) or (printing adj head$1))	USPAT; EPO; DERWENT; USOCR	2002/10/03 12:30
-	28	((table$1 or list$1) near4 ((print adj head$1) or (printing adj head$1))) and (((((postage or postal) adj2 meter$1) or PSD$1 or (postal adj security adj device$1)) and invoice$1 or meter$1 or franking))	USPAT; EPO; DERWENT; USOCR	2002/10/03 12:39
-	7964	((((postage or postal) adj2 meter$1) or PSD$1 or (postal adj security adj device$1))or franking)	USPAT; EPO; DERWENT; USOCR	2002/10/03 12:40
-	100	(((((postage or postal) adj2 meter$1) or PSD$1 or (postal adj security adj device$1))or franking)) same server$1	USPAT; EPO; DERWENT; USOCR	2002/10/03 12:40
-	12	((((((postage or postal) adj2 meter$1) or PSD$1 or (postal adj security adj device$1))or franking)) same server$1) and mechanical	USPAT; EPO; DERWENT; USOCR	2002/10/03 12:48
-	44	(electro adj mechanical) same (((((postage or postal) adj2 meter$1) or PSD$1 or (postal adj security adj device$1))or franking))	USPAT; EPO; DERWENT; USOCR	2002/10/03 12:51
-	565	reset$4 same (((((postage or postal) adj2 meter$1) or PSD$1 or (postal adj security adj device$1))or franking))	USPAT; EPO; DERWENT; USOCR	2002/10/03 12:52
-	253	(reset$4 same (((((postage or postal) adj2 meter$1) or PSD$1 or (postal adj security adj device$1))or franking))) and 705/$.ccls.	USPAT; EPO; DERWENT; USOCR	2002/10/03 12:52
-	253	((reset$4 same (((((postage or postal) adj2 meter$1) or PSD$1 or (postal adj security adj device$1))or franking))) and 705/$.ccls.) and (((((postage or postal) adj2 meter$1) or PSD$1 or (postal adj security adj device$1)) and invoice$1 or meter$1 or franking))	USPAT; EPO; DERWENT; USOCR	2002/10/03 12:52
-	46	((reset$4 same (((((postage or postal) adj2 meter$1) or PSD$1 or (postal adj security adj device$1))or franking))) and 705/$.ccls.) and ((print adj head$1) or (printing adj head$1))	USPAT; EPO; DERWENT; USOCR	2002/10/03 12:52
-	3272	MECHANICAL AND SERVER$1	USPAT	2002/10/07 10:57
-	82	(MECHANICAL AND SERVER$1) AND POSTAL	USPAT	2002/10/07 10:58
-	25	((MECHANICAL AND SERVER$1) AND POSTAL) AND (METER$1 OR FRANK$3)	USPAT	2002/10/07 11:05
-	75	705/403.CCLS.	USPAT	2002/10/07 11:59
-	43	(RECHARG$5 OR RESET$4) NEAR10 (MECHANICAL OR TRADITIONAL) NEAR10 (METER$1 OR FRANKING OR PSD$1)	USPAT	2002/10/07 12:04
-	32	PLURALITY NEAR4 (FRANKING ADJ2(METER$1 OR MACHINE$1))	USPAT	2002/10/07 12:17
-	211	PLURALITY NEAR4 (POST$4 ADJ2(METER$1 OR MACHINE$1))	USPAT	2002/10/07 12:29
-	103	(PLURALITY NEAR4 (POST$4 ADJ2(METER$1 OR MACHINE$1))) AND MECHANICAL	USPAT	2002/10/07 12:15
-	0	PLURALITY NEAR4 (MECHANICAL AND (DIGITAL OR PSD$1 OR ELECTRON$4))NEAR4 (FRANKING ADJ2(METER$1 OR MACHINE$1))	USPAT	2002/10/07 12:18
-	0	PLURALITY NEAR4 (MECHANICAL AND (DIGITAL OR PSD$1 OR ELECTRON$4))NEAR4 (POST$4 ADJ2(METER$1 OR MACHINE$1))	USPAT	2002/10/07 12:19
-	0	(MECHANICAL AND (DIGITAL OR PSD$1 OR ELECTRON$4))NEAR4 (FRANKING ADJ2(METER$1 OR MACHINE$1)) NEAR10 NETWORK$3	USPAT	2002/10/07 12:19

-	0	(MECHANICAL AND (DIGITAL OR PSD$1 OR ELECTRON$4))NEAR10 (FRANKING ADJ2(METER$1 OR MACHINE$1)) NEAR10 NETWORK$3	USPAT	2002/10/07 12:19
-	0	(MECHANICAL ADJ5 (POST$4 ADJ2(METER$1 OR MACHINE$1))) NEAR10 NETWORK$3	USPAT	2002/10/07 12:20
-	37	(POST$4 ADJ2(METER$1 OR MACHINE$1)) NEAR10 NETWORK$3	USPAT	2002/10/07 12:21
-	16	((POST$4 ADJ2(METER$1 OR MACHINE$1)) NEAR10 NETWORK$3) AND MECHANICAL	USPAT	2002/10/07 12:25
-	23	705/403.CCLS. AND NETWORK$3	USPAT	2002/10/07 12:25
-	73	PLURALITY ADJ3 (POST$4 ADJ2(METER$1 OR MACHINE$1))	USPAT	2002/10/07 12:32
-	0	PLURALITY ADJ3 MECHANICAL ADJ3(POST$4 ADJ2(METER$1 OR MACHINE$1))	USPAT	2002/10/07 12:35
-	0	PLURALITY ADJ3 MECHANICAL ADJ3(FRANKING ADJ2(METER$1 OR MACHINE$1))	USPAT	2002/10/07 12:35
-	0	MULTIPLE ADJ3 MECHANICAL ADJ3(POST$4 ADJ2(METER$1 OR MACHINE$1))	USPAT	2002/10/07 13:19
-	0	NETWORK$3 NEAR10 MECHANICAL ADJ3(POST$4 ADJ2(METER$1 OR MACHINE$1))	USPAT	2002/10/07 13:25
-	66	TRADITIONAL ADJ7 (POST$4 ADJ2(METER$1 OR MACHINE$1))	USPAT	2002/10/07 13:33
-	1	4498187.PN.	USPAT	2002/10/07 13:34
-	1	3255493.PN.	USPAT	2002/10/07 13:35
-	977	SIMJIAN	USPAT	2002/10/07 13:35
-	47	SIMJIAN.INV.	USPAT	2002/10/07 13:35
-	8	SIMJIAN.INV. AND METER$1	USPAT	2002/10/07 13:50
-	0	PITNEY ADJ BOWES$1.ASN. AND KIN.INV.	USPAT	2002/10/07 13:51
-	12	(PITNEY ADJ BOWES$1.ASN.) AND KIM.INV.	USPAT	2002/10/07 13:51
-	15	("3792446" | "4097923" | "4122532" | "4138735" | "4447890" | "4498187" | "4752950" | "4807139" | "4811234" | "4812992" | "4837701" | "4853864" | "4908770" | "4978839" | "5077660").PN.	USPAT	2002/10/07 13:52
-	7	(("4853864") or ("4908770") or ("5526271") or ("5570290") or ("5701250") or ("6005945") or ("6442571")).PN.	USPAT	2002/10/08 11:54
-	1	("5586037").PN.	USPAT	2002/10/08 12:23
-	3	(("5224046") or ("4097923") or ("4752950")).PN.	USPAT	2002/10/08 12:23
-	3	((("5224046") or ("4097923") or ("4752950")).PN.) and (print$3 or head$1)	USPAT	2002/10/08 13:14
-	0	((((("5224046") or ("4097923") or ("4752950")).PN.) and (print$3 or head$1)) AND INVOICE$1	USPAT	2002/10/08 13:22
-	0	(print$3 adj head$1) same invoice$1 same (frank$3 or meter$1)	USPAT	2002/10/08 13:23
-	23	(print$3 adj head$1)and invoice$1 and (frank$3 or meter$1)	USPAT	2002/10/08 13:26
-	5	(list$1 near10 (print$3 adj head$1)) and (franking or meter$1 or psd$1)	USPAT	2002/10/08 13:27
-	134	minitel	USPAT	2002/10/09 13:25
-	7519	705/$.ccls.	USPAT	2002/10/09 13:26
-	19	705/$.ccls. and minitel	USPAT	2002/10/09 13:26
-	3	705/$.ccls. and (minitel and meter$1)	USPAT	2002/10/09 13:26
-	29	minitel and (post$3 or franking)	USPAT	2002/10/09 13:27
-	14	(minitel and (post$3 or franking)) and 705/$.ccls.	USPAT	2002/10/09 13:27
-	10	minitel and meter$1	USPAT	2002/10/09 13:30
-	0	minitel and franking	USPAT	2002/10/09 13:30
-	2	(("5224046") or ("4752950")).PN.	USPAT	2002/10/21 08:59
-	2	((("5224046") or ("4752950")).PN.) and display$3	USPAT	2002/10/21 08:59
-	10	(("6224571") or ("4752950") or ("5224046") or ("4853864") or ("4908770") or ("5526271") or ("5570290") or ("5701250") or ("6005945") or ("6385731")).PN.	USPAT	2002/10/21 09:45
-	2	(("5224046"|"4752950").PN.) and protocol$1	USPAT	2002/10/21 09:50
-	188631	(postage adj meter$1) or psd$1 or meter$1 or (franking adj meter$1) or (franking adj machine$1) or (postal adj meter$1) or (postal adj machine$1)	USPAT	2002/10/21 09:52
-	31475	tcp or ip	USPAT	2002/10/21 09:51
-	135	(tcp or ip) same ((postage adj meter$1) or psd$1 or meter$1 or (franking adj meter$1) or (franking adj machine$1) or (postal adj meter$1) or (postal adj machine$1))	USPAT	2002/10/21 09:52
-	4856	(postage adj meter$1) or psd$1 or (franking adj meter$1) or (franking adj machine$1) or (postal adj meter$1) or (postal adj machine$1)	USPAT	2003/05/05 14:54

-	144	((postage adj meter$1) or psd$1 or (franking adj meter$1) or (franking adj machine$1) or (postal adj meter$1) or (postal adj machine$1)) and (tcp or ip)	USPAT	2002/10/21 09:52
-	121	(((postage adj meter$1) or psd$1 or (franking adj meter$1) or (franking adj machine$1) or (postal adj meter$1) or (postal adj machine$1)) and (tcp or ip)) and @ad<19980911	USPAT	2002/10/21 09:53
-	0	((("6224571") or ("4752950") or ("5224046") or ("4853864") or ("4908770") or ("5526271") or ("5570290") or ("5701250") or ("6005945") or ("6385731")).PN.) and (tcp or ip)	USPAT	2002/10/21 09:53
-	4464	(postage adj meter$1) or psd or (franking adj meter$1) or (franking adj machine$1) or (postal adj meter$1) or (postal adj machine$1)	USPAT	2002/10/21 09:53
-	103	((postage adj meter$1) or psd or (franking adj meter$1) or (franking adj machine$1) or (postal adj meter$1) or (postal adj machine$1)) and (tcp or ip)	USPAT	2002/10/21 09:53
-	84	(((postage adj meter$1) or psd or (franking adj meter$1) or (franking adj machine$1) or (postal adj meter$1) or (postal adj machine$1)) and (tcp or ip)) and @ad<19980911	USPAT	2002/10/21 09:55
-	8	tcp and ((((postage adj meter$1) or psd or (franking adj meter$1) or (franking adj machine$1) or (postal adj meter$1) or (postal adj machine$1)) and (tcp or ip)) and @ad<19980911)	USPAT	2002/10/21 09:56
-	137	minitel	USPAT	2002/10/21 09:57
-	0	minitel and ((postage adj meter$1) or psd or (franking adj meter$1) or (franking adj machine$1) or (postal adj meter$1) or (postal adj machine$1))	USPAT	2002/10/21 09:57
-	426	videotex	USPAT	2002/10/21 09:57
-	0	videotex and ((postage adj meter$1) or psd or (franking adj meter$1) or (franking adj machine$1) or (postal adj meter$1) or (postal adj machine$1))	USPAT	2002/10/21 09:58
-	24	teletel	USPAT	2002/10/21 09:58
-	6	teletel and (postal or postage or meter$1 or franking)	USPAT	2002/10/21 10:13
-	11	kermit adj protocol$1	USPAT	2002/10/21 10:00
-	3	telco and ((postage adj meter$1) or psd or (franking adj meter$1) or (franking adj machine$1) or (postal adj meter$1) or (postal adj machine$1))	USPAT	2002/10/21 10:14
-	1	teleco and ((postage adj meter$1) or psd or (franking adj meter$1) or (franking adj machine$1) or (postal adj meter$1) or (postal adj machine$1))	USPAT	2002/10/21 10:15
-	7168	(printing adj head$1) or (print adj head41)	USPAT	2002/10/21 10:15
-	16156	(printing adj head$1) or (print adj head$1)	USPAT	2002/10/21 10:16
-	436	((printing adj head$1) or (print adj head$1)) and ((postage adj meter$1) or psd or (franking adj meter$1) or (franking adj machine$1) or (postal adj meter$1) or (postal adj machine$1))	USPAT	2002/10/21 10:16
-	378	(((printing adj head$1) or (print adj head$1)) and ((postage adj meter$1) or psd or (franking adj meter$1) or (franking adj machine$1) or (postal adj meter$1) or (postal adj machine$1))) and @ad<19980911	USPAT	2002/10/21 10:16
-	109	((((printing adj head$1) or (print adj head$1)) and ((postage adj meter$1) or psd or (franking adj meter$1) or (franking adj machine$1) or (postal adj meter$1) or (postal adj machine$1))) and @ad<19980911) and 705/$.ccls.	USPAT	2002/10/21 10:16
-	19	((printing adj head$1) or (print adj head$1)) near5 list$3	USPAT	2002/10/21 10:17
-	3	(((printing adj head$1) or (print adj head$1)) near5 list$3) and ((postage adj meter$1) or psd or (franking adj meter$1) or (franking adj machine$1) or (postal adj meter$1) or (postal adj machine$1))	USPAT	2002/10/21 10:17
-	176	((postage adj meter$1) or psd or (franking adj meter$1) or (franking adj machine$1) or (postal adj meter$1) or (postal adj machine$1)) near10 ((printing adj head$1) or (print adj head$1))	USPAT	2002/10/21 10:18
-	159	(((postage adj meter$1) or psd or (franking adj meter$1) or (franking adj machine$1) or (postal adj meter$1) or (postal adj machine$1)) near10 ((printing adj head$1) or (print adj head$1))) and @ad<19980911	USPAT	2002/10/21 10:18
-	42	((((postage adj meter$1) or psd or (franking adj meter$1) or (franking adj machine$1) or (postal adj meter$1) or (postal adj machine$1)) near10 ((printing adj head$1) or (print adj head$1))) and @ad<19980911) and 705/$.ccls.	USPAT	2002/10/21 10:23

-	1	(((((postage adj meter$1) or psd or (franking adj meter$1) or (franking adj machine$1) or (postal adj meter$1) or (postal adj machine$1)) near10 ((printing adj head$1) or (print adj head$1))) and @ad<19980911) and 705/$.ccls.) and server$1	USPAT	2002/10/21 10:19
-	1	display$3 near6 (list$1 or table) near6 ((printing adj head$1) or (print adj head$1))	USPAT	2002/10/21 10:24
-	309	display$3 near6 ((printing adj head$1) or (print adj head$1))	USPAT	2002/10/21 10:24
-	22	(display$3 near6 ((printing adj head$1) or (print adj head$1))) and ((postage adj meter$1) or psd or (franking adj meter$1) or (franking adj machine$1) or (postal adj meter$1) or (postal adj machine$1))	USPAT	2002/10/21 10:25
-	2139	pitney adj bowes.asn.	USPAT	2002/10/21 10:26
-	382	(pitney adj bowes.asn.) and head$1	USPAT	2002/10/21 10:26
-	6	((pitney adj bowes.asn.) and head$1) and server$1	USPAT	2002/10/21 10:29
-	966	(chang$3 or updat$3) near5 ((printing adj head$1) or (print adj head$1))	USPAT	2002/10/21 10:30
-	966	((chang$3 or updat$3) near5 ((printing adj head$1) or (print adj head$1))) and head$1	USPAT	2002/10/21 10:30
-	19	(((chang$3 or updat$3) near5 ((printing adj head$1) or (print adj head$1))) and head$1) and (pitney adj bowes.asn.)	USPAT	2002/10/21 10:32
-	4	((("6224571") or ("4752950") or ("5224046") or ("4853864") or ("4908770") or ("5526271") or ("5570290") or ("5701250") or ("6005945") or ("6385731")).PN.) and head$1	USPAT	2002/10/21 10:32
-	19854	705/$.ccls.	USPAT; US-PGPUB; EPO; JPO; DERWENT; IBM_TDB	2003/04/29 18:29
-	63	((postage or postal or franking) adj (meter$1 or machine$1)) same ((off adj line) or offline or disconnect$2)	USPAT; US-PGPUB; EPO; JPO; DERWENT; IBM_TDB	2003/04/29 18:36
-	54	(((postage or postal or franking) adj (meter$1 or machine$1)) same ((off adj line) or offline or disconnect$2)) and @ad<19980801	USPAT; US-PGPUB; EPO; JPO; DERWENT; IBM_TDB	2003/04/29 18:30
-	257	(plurality or multiple) near3 ((postage or postal or franking) adj (meter$1 or machine$1))	USPAT; US-PGPUB; EPO; JPO; DERWENT; IBM_TDB	2003/04/29 18:37
-	262	(plurality or multiple) near3 ((atm postage or postal or franking) adj (meter$1 or machine$1))	USPAT; US-PGPUB; EPO; JPO; DERWENT; IBM_TDB	2003/04/29 19:14
-	3	((plurality or multiple) near3 ((atm postage or postal or franking) adj (meter$1 or machine$1))) same ((off adj line) or offline or (disc adj connect$2) or disconnect$2)	USPAT; US-PGPUB; EPO; JPO; DERWENT; IBM_TDB	2003/04/29 18:38
-	28	((plurality or multiple) near3 ((atm postage or postal or franking) adj (meter$1 or machine$1))) and ((off adj line) or offline or (disc adj connect$2) or disconnect$2)	USPAT; US-PGPUB; EPO; JPO; DERWENT; IBM_TDB	2003/04/29 18:38
-	857	(atm) adj (machine$1)	USPAT; US-PGPUB; EPO; JPO; DERWENT; IBM_TDB	2003/04/29 18:43

-	8	((atm) adj (machine$1)) and (offline)	USPAT; US-PGPUB; EPO; JPO; DERWENT; IBM_TDB	2003/04/29 18:44
-	718	705/$.ccls. and offline	USPAT; US-PGPUB; EPO; JPO; DERWENT; IBM_TDB	2003/04/29 18:44
-	457	offline same (meter$1 or machine$1)	USPAT; US-PGPUB; EPO; JPO; DERWENT; IBM_TDB	2003/04/29 18:45
-	45	(offline same (meter$1 or machine$1)) and 705/$.ccls.	USPAT; US-PGPUB; EPO; JPO; DERWENT; IBM_TDB	2003/04/29 18:45
-	11	((offline same (meter$1 or machine$1)) and 705/$.ccls.) and @ad<19980501	USPAT; US-PGPUB; EPO; JPO; DERWENT; IBM_TDB	2003/04/29 18:47
-	4	(obtain$3 near4 (current or latest) near4 invoice)	USPAT; US-PGPUB; EPO; JPO; DERWENT; IBM_TDB	2003/04/29 18:49
-	53	((current or latest) near4 invoice)	USPAT; US-PGPUB; EPO; JPO; DERWENT; IBM_TDB	2003/04/29 18:49
-	8	(((current or latest) near4 invoice)) and ((off adj line) or offline or disconnect$2)	USPAT; US-PGPUB; EPO; JPO; DERWENT; IBM_TDB	2003/04/29 18:50
-	27	current adj invoic$3	USPAT; US-PGPUB; EPO; JPO; DERWENT; IBM_TDB	2003/04/29 18:53
-	11	offline near8 (franking or meter$1)	USPAT; US-PGPUB; EPO; JPO; DERWENT; IBM_TDB	2003/04/29 18:56
-	7	("4574352" | "5613148" | "5682468" | "5689703" | "5692111" | "5832191" | "6012083").PN.	USPAT	2003/04/29 18:55
-	139	(off adj line) near8 (franking or meter$1 or kiosk$1)	USPAT; US-PGPUB; EPO; JPO; DERWENT; IBM_TDB	2003/04/29 19:05
-	68	((off adj line) near8 (franking or meter$1 or kiosk$1)) and @ad<19980901	USPAT; US-PGPUB; EPO; JPO; DERWENT; IBM_TDB	2003/04/29 18:57

-	1017	((off adj line) or (dis adj connect$2) or disconnect$2 or offline) near8 (franking or (atm adj machine$1) or (teller adj machine$1) meter$1 or kiosk$1 or psd)	USPAT; US-PGPUB; EPO; JPO; DERWENT; IBM_TDB	2003/05/05 17:24
-	1826	(supervis$2 or manag$4) same (franking or (atm adj machine$1) or (teller adj machine$1) meter$1 or kiosk$1 or psd)	USPAT; US-PGPUB; EPO; JPO; DERWENT; IBM_TDB	2003/04/29 19:08
-	33	((supervis$2 or manag$4) same (franking or (atm adj machine$1) or (teller adj machine$1) meter$1 or kiosk$1 or psd)) and (((off adj line) or (dis adj connect$2) or disconnect$2 or offline) near8 (franking or (atm adj machine$1) or (teller adj machine$1) meter$1 or kiosk$1 or psd))	USPAT; US-PGPUB; EPO; JPO; DERWENT; IBM_TDB	2003/04/29 19:08
-	61	((plurality or multiple) near3 ((atm postage or postal or franking) adj (meter$1 or machine$1))) and (lan or wan or network$3)	USPAT; US-PGPUB; EPO; JPO; DERWENT; IBM_TDB	2003/04/29 19:14
-	39	(((plurality or multiple) near3 ((atm postage or postal or franking) adj (meter$1 or machine$1))) and (lan or wan or network$3)) and @ad<19980701	USPAT; US-PGPUB; EPO; JPO; DERWENT; IBM_TDB	2003/04/29 19:19
-	508	lan same (meter$1 or postal or postage or franking)	USPAT; US-PGPUB; EPO; JPO; DERWENT; IBM_TDB	2003/04/29 19:20
-	60	(lan same (meter$1 or postal or postage or franking)) and 705/$.ccls.	USPAT; US-PGPUB; EPO; JPO; DERWENT; IBM_TDB	2003/04/29 19:20
-	16	((lan same (meter$1 or postal or postage or franking)) and 705/$.ccls.) and @ad<19980801	USPAT; US-PGPUB; EPO; JPO; DERWENT; IBM_TDB	2003/04/29 19:20
-	77	705/403.ccls.	USPAT; US-PGPUB; EPO; JPO; DERWENT; IBM_TDB	2003/05/05 14:49
-	2	705/403.ccls. and (graph or statistic$1)	USPAT; US-PGPUB; EPO; JPO; DERWENT; IBM_TDB	2003/05/05 14:47
-	295	705/403.ccls. or 705/401.ccls.	USPAT; US-PGPUB; EPO; JPO; DERWENT; IBM_TDB	2003/05/05 14:49
-	3	(705/403.ccls. or 705/401.ccls.) and graph	USPAT; US-PGPUB; EPO; JPO; DERWENT; IBM_TDB	2003/05/05 14:50

-	1628273	table$1 or spreadsheet or matrix or statistic$1	USPAT; US-PGPUB; EPO; JPO; DERWENT; IBM_TDB	2003/05/05 14:51
-	24772	display$3 near4 (dimension or chart or graph)	USPAT; US-PGPUB; EPO; JPO; DERWENT; IBM_TDB	2003/05/05 14:52
-	5096	(postage adj meter$1) or psd$1 or (franking adj meter$1) or (franking adj machine$1) or (postal adj meter$1) or (postal adj machine$1)	USPAT	2003/05/05 17:04
-	36	(table$1 or spreadsheet or matrix or statistic$1) and (display$3 near4 (dimension or chart or graph)) and ((postage adj meter$1) or psd$1 or (franking adj meter$1) or (franking adj machine$1) or (postal adj meter$1) or (postal adj machine$1))	USPAT	2003/05/05 14:58
-	79	((postage adj meter$1) or psd$1 or (franking adj meter$1) or (franking adj machine$1) or (postal adj meter$1) or (postal adj machine$1)) same graph	USPAT	2003/05/05 14:59
-	0	(((postage adj meter$1) or psd$1 or (franking adj meter$1) or (franking adj machine$1) or (postal adj meter$1) or (postal adj machine$1)) same graph) and gui	USPAT	2003/05/05 14:59
-	0	((postage adj meter$1) or psd$1 or (franking adj meter$1) or (franking adj machine$1) or (postal adj meter$1) or (postal adj machine$1)) and gra	USPAT	2003/05/05 14:59
-	0	((postage adj meter$1) or psd$1 or (franking adj meter$1) or (franking adj machine$1) or (postal adj meter$1) or (postal adj machine$1)) and grahp	USPAT	2003/05/05 14:59
-	767	((postage adj meter$1) or psd$1 or (franking adj meter$1) or (franking adj machine$1) or (postal adj meter$1) or (postal adj machine$1)) and graph	USPAT	2003/05/05 14:59
-	7	(((postage adj meter$1) or psd$1 or (franking adj meter$1) or (franking adj machine$1) or (postal adj meter$1) or (postal adj machine$1)) and graph) and gui	USPAT	2003/05/05 14:59
-	73	(705/403.ccls. or 705/401.ccls.) and graph$3	USPAT	2003/05/05 15:00
-	55	((705/403.ccls. or 705/401.ccls.) and graph$3) and (table$1 or spreadsheet or matrix or statistic$1)	USPAT; US-PGPUB; EPO; JPO; DERWENT; IBM_TDB	2003/05/05 15:00
-	57427	345/$.ccls.	USPAT; US-PGPUB; EPO; JPO; DERWENT; IBM_TDB	2003/05/05 15:01
-	6	345/$.ccls. and (705/403.ccls. or 705/401.ccls.)	USPAT; US-PGPUB; EPO; JPO; DERWENT; IBM_TDB	2003/05/05 15:02
-	128	705/60.ccls. or 705/61.ccls.	USPAT; US-PGPUB; EPO; JPO; DERWENT; IBM_TDB	2003/05/05 15:26
-	8	("4097923" | "4376299" | "4447890" | "5224046" | "5359182" | "5428353" | "5469497" | "5602742").PN.	USPAT	2003/05/05 15:09
-	1851	709/223.ccls.	USPAT; US-PGPUB; EPO; JPO; DERWENT; IBM_TDB	2003/05/05 15:27

-	2089	709/224.ccls.	USPAT; US-PGPUB; EPO; JPO; DERWENT; IBM_TDB	2003/05/05 15:27
-	3519	709/224.ccls. or 709/223.ccls.	USPAT; US-PGPUB; EPO; JPO; DERWENT; IBM_TDB	2003/05/05 15:27
-	0	(709/224.ccls. or 709/223.ccls.) and (705/60.ccls. or 705/61.ccls.)	USPAT; US-PGPUB; EPO; JPO; DERWENT; IBM_TDB	2003/05/05 15:27
-	0	(709/224.ccls. or 709/223.ccls.) and (705/403.ccls. or 705/401.ccls.)	USPAT; US-PGPUB; EPO; JPO; DERWENT; IBM_TDB	2003/05/05 15:27
-	0	(display$3 near4 (dimension or chart or graph)) same (705/60.ccls. or 705/61.ccls.)	USPAT; US-PGPUB; EPO; JPO; DERWENT; IBM_TDB	2003/05/05 15:28
-	0	(display$3 near4 (dimension or chart or graph)) and (705/60.ccls. or 705/61.ccls.)	USPAT; US-PGPUB; EPO; JPO; DERWENT; IBM_TDB	2003/05/05 15:28
-	87	(705/60.ccls. or 705/61.ccls.) and (table$1 or graph or chart)	USPAT; US-PGPUB; EPO; JPO; DERWENT; IBM_TDB	2003/05/05 17:14
-	65	((705/60.ccls. or 705/61.ccls.) and (table$1 or graph or chart)) and display$3	USPAT; US-PGPUB; EPO; JPO; DERWENT; IBM_TDB	2003/05/05 16:56